

Installing and Maintaining BN Platforms

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Shielded-compliant cables must be used with this unit to ensure compliance with the Class A limits.

EN 55 022 Declaration of Conformance

This is to certify that the Bay Networks products in this book are shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022:1987 Class A (CISPR 22:1985/BS 6527:1988).

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Voluntary Control Council for Interference (VCCI) Statement

This equipment is in the 1st category (information equipment to be used in commercial and/or industrial areas) and conforms to the standards set by the Voluntary Control Council for Interference by Data Processing Equipment and Electronic Office Machines that are aimed at preventing radio interference in commercial and/or industrial areas.

Consequently, when this equipment is used in a residential area or in an adjacent area thereto, radio interference may be caused to equipment such as radios and TV receivers.

Compliance with the applicable regulations is dependent upon the use of shielded cables. The user is responsible for procuring the appropriate cables. Read instructions for correct handling.

Canada Requirements Only

Canada CS-03 Rules and Regulations

Note: The Canadian Department of Communications label identifies certified equipment. The certification means that the equipment meets certain telecommunications network protective operations and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent the degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Canada CS-03 — Règles et règlements

Note: L'étiquette du ministère des Communications du Canada indique que l'appareillage est certifié, c'est-à-dire qu'il respecte certaines exigences de sécurité et de fonctionnement visant les réseaux de télécommunications. Le ministère ne garantit pas que l'appareillage fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer l'appareillage, s'assurer qu'il peut être branché aux installations du service de télécommunications local. L'appareillage doit aussi être raccordé selon des méthodes acceptées. Dans certains cas, le câblage interne du service de télécommunications utilisé pour une ligne individuelle peut être allongé au moyen d'un connecteur certifié (prolongateur téléphonique). Le client doit toutefois prendre note qu'une telle installation n'assure pas un service parfait en tout temps.

Les réparations de l'appareillage certifié devraient être confiées à un service d'entretien canadien désigné par le fournisseur. En cas de réparation ou de modification effectuées par l'utilisateur ou de mauvais fonctionnement de l'appareillage, le service de télécommunications peut demander le débranchement de l'appareillage.

Pour leur propre sécurité, les utilisateurs devraient s'assurer que les mises à la terre des lignes de distribution d'électricité, des lignes téléphoniques et de la tuyauterie métallique interne sont raccordées ensemble. Cette mesure de sécurité est particulièrement importante en milieu rural.

Attention: Les utilisateurs ne doivent pas procéder à ces raccordements eux-mêmes mais doivent plutôt faire appel aux pouvoirs de réglementation en cause ou à un électricien, selon le cas.

Canada Requirements Only *(continued)*

D. O. C. Explanatory Notes: Equipment Attachment Limitations

The Canadian Department of Communications label identifies certified equipment. This certification meets certain telecommunication network protective, operational and safety requirements. The department does not guarantee the equipment will operate to the users satisfaction.

Before installing the equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above condition may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electrical inspection authority, or electrician, as appropriate.

Notes explicatives du ministère des Communications: limites visant les accessoires

L'étiquette du ministère des Communications du Canada indique que l'appareillage est certifié, c'est-à-dire qu'il respecte certaines exigences de sécurité et de fonctionnement visant les réseaux de télécommunications. Le ministère ne garantit pas que l'appareillage fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer l'appareillage, s'assurer qu'il peut être branché aux installations du service de télécommunications local. L'appareillage doit aussi être raccordé selon des méthodes acceptées. Dans certains cas, le câblage interne du service de télécommunications utilisé pour une ligne individuelle peut être allongé au moyen d'un connecteur certifié (prolongateur téléphonique). Le client doit toutefois prendre note qu'une telle installation n'assure pas un service parfait en tout temps.

Les réparations de l'appareillage certifié devraient être confiées à un service d'entretien canadien désigné par le fournisseur. En cas de réparation ou de modification effectuées par l'utilisateur ou de mauvais fonctionnement de l'appareillage, le service de télécommunications peut demander le débranchement de l'appareillage.

Pour leur propre sécurité, les utilisateurs devraient s'assurer que les mises à la terre des lignes de distribution d'électricité, des lignes téléphoniques et de la tuyauterie métallique interne sont raccordées ensemble. Cette mesure de sécurité est particulièrement importante en milieu rural.

Attention: Les utilisateurs ne doivent pas procéder à ces raccordements eux-mêmes mais doivent plutôt faire appel aux pouvoirs de réglementation en cause ou à un électricien, selon le cas.

Canada Requirements Only *(continued)*

Canadian Department of Communications Radio Interference Regulations

This digital apparatus (Access Feeder Node, Access Link Node, Access Node, Access Stack Node, Backbone Concentrator Node, Backbone Concentrator Node Switch, Backbone Link Node, Backbone Link Node Switch, Concentrator Node, Feeder Node, Link Node) does not exceed the Class A limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Réglement sur le brouillage radioélectrique du ministère des Communications

Cet appareil numérique (Access Feeder Node, Access Link Node, Access Node, Access Stack Node, Backbone Concentrator Node, Backbone Concentrator Node Switch, Backbone Link Node, Backbone Link Node Switch, Concentrator Node, Feeder Node, Link Node) respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada.

T1 Service Compliance Statements

T1 Service

NOTE: This T1 Service notice applies to you only if you have received a single or dual port Multi-Channel T1 (MCT1) Link Module (which provides an internal CSU).

This equipment complies with Part 68 of FCC Rules. Please note the following:

1. You are required to request T1 service from the telephone company before you connect the CSU to a T1 network. When you request T1 service, you must provide the telephone company with the following data:
 - The Facility Interface Code
Provide the telephone company with both codes below:
 - 04DU9-B (1.544 MB D4 framing format)
 - 04DU9-C (1.544 MB ESF format)The telephone company will select the code it has available.
 - The Service Order Code: 6.0F
 - The required USOC jack: RJ48C
 - The make, model number, and FCC Registration number of the CSU.
2. Your telephone company may make changes to its facilities, equipment, operations, or procedures that could affect the proper functioning of your equipment. The telephone company will notify you in advance of such changes to give you an opportunity to maintain uninterrupted telephone service.
3. If your CSU causes harm to the telephone network, the telephone company may temporarily discontinue your service. If possible, they will notify you in advance, but if advance notice is not practical, you will be notified as soon as possible and will be informed of your right to file a complaint with the FCC.
4. If you experience trouble with the CSU, please contact Bay Networks Technical Response Center in your area for service or repairs. Repairs should be performed only by service personnel authorized by Bay Networks, Inc.

United States	1-800-2LAN-WAN
Valbonne, France	(33) 92-966-968
Sydney, Australia	(61) 2-903-5800
Tokyo, Japan	(81) 3-328-005
5. You are required to notify the telephone company when you disconnect the CSU from the network and when you disconnect the BCNX or BLNX from the network.

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About This Guide

If you are responsible for installing and configuring Bay Networks Backbone Node hardware platforms, read this guide for installation instructions and user-serviceable hardware procedures for the Backbone Node family of high-speed hardware platforms (BLN[®], BLN-2, BCN[®], and BCN RLC).

This guide describes how to

- Prepare for hardware platforms installation
- Install the hardware platforms
- Access the hardware platforms locally and remotely
- Power up the hardware platforms
- Accessing the hardware platforms interior
- Hot-swap certain user-serviceable hardware components
- Interpret LEDs

Audience

Written for system and network managers, this guide describes how to install and configure Bay Networks BLN, BLN-2, BCN, and BCN RLC hardware.

Conventions

angle brackets (< >)	Indicate that you choose the text to enter based on the description inside the brackets. Do not type the brackets when entering the command. Example: if command syntax is ping <ip_address>, you enter ping 192.32.10.12
bold text	Indicates text that you need to enter and command names in text. Example: Use the dinfo command.
brackets ([])	Indicate optional elements. You can choose none, one, or all of the options.
<i>italic text</i>	Indicates variable values in command syntax descriptions, new terms, file and directory names, and book titles.
quotation marks (“ ”)	Indicate the title of a chapter or section within a book.
separator (>)	Separates menu and option names in instructions and internal pin-to-pin wire connections. Example: Protocols > AppleTalk identifies the AppleTalk option in the Protocols menu. Example: Pin 7 > 19 > 20
screen text	Indicates data that appears on the screen. Example: Set Bay Networks Trap Monitor Filters
vertical line ()	Indicates that you enter only one of the parts of the command. The vertical line separates choices. Do not type the vertical line when entering the command. Example: If the command syntax is show at routes nets , you enter either show at routes or show at nets , but not both.

Acronyms

ANSI	American National Standards Institute
ARE	ATM Routing Engine
ATM	Asynchronous Transfer Mode
BN	Backbone Node
BCN	Backbone Concentrator Node
BCN RLC	Backbone Concentrator Node with Redundant Line Cord
BLN	Backbone Link Node
BLN-2	Backbone Link Node-2
Btu	British thermal unit
DRAM	dynamic random-access memory
EMC	electromagnetic compatibility
EIA	Electronic Industry Association
FDDI	Fiber Distributed Data Interface
FRE	Fast Routing Engine
FRE-2	Fast Routing Engine-2
GAME	Gate Access Management Entity
HDMC	Harpoon Diagnostic Console Monitor
HSSI	high speed serial interface
ILI	intelligent link interface
MAC	Media Access Control
MOP	Maintenance Operations Protocol
NEMA	National Electrical Manufacturers Association
NVFS	nonvolatile file system
OSI	Open Systems Interconnection
PPX	Parallel Packet Express
QENET	Quad Ethernet Link Module
SNA	Systems Network Architecture
SNMP	Simple Network Management Protocol
SRM-F	System Resource Module-Front
SRM-L	System Resources Module-Link

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Santa Clara, CA	1-800-2LANWAN	(408) 764-1188
Valbonne, France	(33) 92-968-968	(33) 92-966-998
Sydney, Australia	(612) 9927-8800	(612) 9927-8811
Tokyo, Japan	(81) 3-5402-0180	(81) 3-5402-0173

Chapter 1

Installing the Backbone Link Node

You install the Backbone Link Node (BLN) hardware platform by

- Preparing for installation
- Setting up the BLN
- Powering up the BLN and observing the hardware platform initialization sequence
- Cabling a console or modem to the BLN to establish a Bay Networks Technician Interface session



Danger: Due to high-energy hazards, only qualified service personnel with written authorization from Bay Networks are permitted to repair a BLN. Chapter 5, “Hot-Swapping Hardware Components,” describes user-serviceable procedures.

The BLN is not designed for use with an I.T. power system (a power distribution system that has no direct connection to earth); the exposed conductive parts of the BLN are grounded.



Caution: Inspect all items for any shipping damage. In particular, ensure that the ports on the rear panel are not damaged. If you detect any damaged or missing items, do not attempt to install the BLN. Contact the Bay Networks Technical Response Center.

Backbone Link Node Overview

The Backbone Link Node is a multiprotocol hardware platform/bridge designed to satisfy the high-performance availability requirements of mission-critical backbone internetworks. These networks transport information using communications subsystems and protocols such as:

- Fiber Distributed Data Interface (FDDI)
- Point-to-Point Protocol (PPP)
- Systems Network Architecture (SNA)

The BLN (Figure 1-1) uses a symmetric multiprocessor architecture with Fast Routing Engine (FRE[®] and FRE-2) processor modules, or ATM Routing Engine (ARE) processor modules, along with the Bay Networks 1-Gb/s Parallel Packet Express (PPX[®]) processor interconnect. The BLN supports four routing engine modules and up to 16 LAN/WAN interfaces (up to four FDDI).

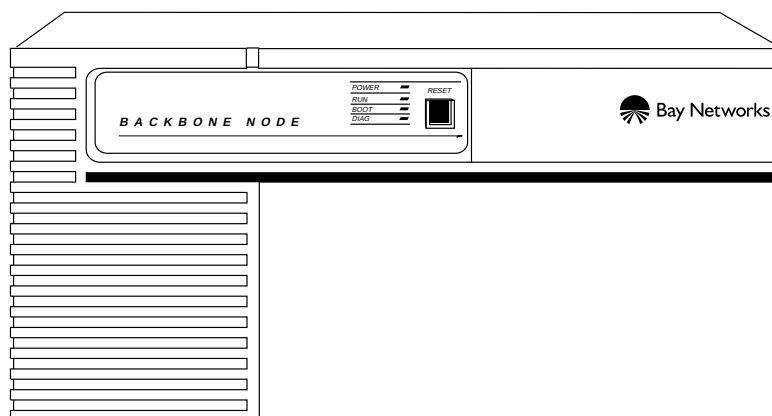


Figure 1-1. Backbone Link Node (BLN)

Preparing for Installation

To prepare for the BLN installation, verify the following:

- Your BLN shipment arrived complete and undamaged
- You have the proper tools and equipment
- Your installation site meets all BLN site requirements
- These requirements are described in detail in the next sections.

Shipment Contents

Verify that the items in the BLN shipment match the items on the packing list affixed to the shipping container (Table 1-1).

Table 1-1. BLN Shipment Contents

Item	Quantity
Backbone Link Node	1
The documentation set, including <i>Read Me First</i> documents, release notes for the system software and Site Manager, <i>Installing and Maintaining BN Hardware platforms</i> (this book), <i>Cable Guide for Hardware platforms and BayStream hardware platforms Platforms</i> , and <i>Quick-Starting Hardware platforms and BayStream hardware platforms Platforms</i>	1
Site Manager Application Software (diskettes or CD-ROM)	1
System software memory card (installed in unit)	1
Hardware package for mounting BLN in an electronic enclosure rack:	
– 10-32 x 0.5-in. panel-mount screws	4
– 10-32 cage nuts	4
Optional: Hardware package for attaching angle brackets to electronic enclosure rack:	
– Rack-mount brackets	2
– 10-32 x 0.5-in. panel-mount screws	4
– 10-32 cage nuts	4
Power cord	1
Optional: Shielded console cable	1

Cables

Make sure that you received the correct cables with your shipment. If you plan to build your own cables, or if you want to order additional cables, refer to *Cable Guide for Routers and BNX Platforms* (router software) or *Cable Guide* (BayStream software).

Additional Equipment

You need to supply the additional equipment listed in Table 1-2.

Table 1-2. Tools and Equipment You Supply

Item	Quantity
ANSI console or PC (to establish a Bay Networks Technician Interface session)	1
Optional: 25-pin male to 9-pin female cable adaptor (needed only if you want to cable a PC directly to BLN to establish a local connection)	1
SPARCstation, PC, IBM RS/6000, or HP 9000 (for the Site Manager interface application, if not already installed)	1
A shielded console cable (only if you did not order one from Bay Networks)	1
Optional: An electronic enclosure rack in which to mount the BLN; rack must meet these requirements: – Heavy-duty steel construction – Electronic Industries Association (EIA) – Standard hole spacing – Width: 19 in. (48.26 cm) – Depth: 24 in. (61 cm) Any electronic enclosure rack panels or doors must contain louvers or screens to prevent overheating.	1
Tape measure (if mounting in a rack)	1
Phillips screwdriver (if mounting in a rack)	1

Site Requirements

To obtain satisfactory BLN performance, your site must meet all of the following electrical, space, and environmental requirements.



Caution: Failure to adhere to these requirements may result in poor equipment performance.

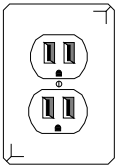
Electrical Requirements

Your installation site must provide a power source that meets the electrical requirements listed below:

- 10 A @ 110 VAC
- 5 A @ 230 VAC

Locate the BLN within 6 ft (1.83 m) of a wall receptacle. Table 1-3 lists the type of wall receptacle a BLN requires.

Table 1-3. Wall Receptacle Requirements

Country	Receptacle	Voltage	Branch Current
United States or Canada	National Electrical Manufacturers Association (NEMA) 5-15R standard receptacle. 	100 to 120 volts	15 A
Other countries	Your BLN distributor supplies the proper cord. It is shipped with the unit from the factory.	200 to 240 volts	10 A

Space Requirements

Make sure the installation site is large enough for the BLN and provides sufficient air plenum (a volume of free space surrounding the hardware platform for heat exhaust). Table 1-4 lists the dimensions of the BLN.

Table 1-4. BLN Dimensions

Height	Depth	Width
14 in. (35.6 cm)	29.9 in. (58.2 cm)	17.3 in. (44 cm)

Table 1-5 lists the number of British thermal units (Btus) generated by the BLN and its air plenum requirements.

Table 1-5. BLN Thermal Output and Air Plenum Requirements

Thermal Output (Maximum Btu/hr)	Location of Air Plenum	Minimum Required Air Plenum
2600	Right	2 in. (5.1 cm)
	Left	2 in. (5.1 cm)
	Front	1 in. (2.5 cm)

Table 1-6 lists the total space needed (dimensions plus air plenum requirements) for the BLN.

Table 1-6. Total Space Required for BLN

Height	Depth	Width
8.75 in. (22.2 cm)	19.5 in. (49.5 cm)	21.3 in. (54.1 cm)

Environmental Requirements

The installation site must meet the environmental requirements listed in Table 1-7.

Table 1-7. Environmental Requirements

Altitude	Humidity	Temperature
0 to 8000 ft (0 to 2400 m)	10% to 90% noncondensing	0°C to 40°C (32° F to 104° F)

Setting Up the Backbone Link Node

We recommend that you install your BLN in an electronic enclosure rack and use angle brackets for added support. If you choose not to use angle brackets when installing the BLN, proceed to “Installing the BLN,” later in this chapter.



Caution: Before you set up your BLN, refer to “Space Requirements” earlier in this chapter to verify that adequate space exists for heat exhaust.

Attaching Angle Brackets

Before you can attach the optional angle brackets, you need the following equipment:

- The optional hardware package containing the angle brackets, rack screws, and cage nuts
- Tape measure
- Phillips screwdriver
- Pen or pencil

Attach the angle brackets to the rack as follows (Figure 1-2):

1. **Measure at least 8.75 in. (22.2 cm) of free vertical space inside the rack and mark the spot.**
2. **Attach each angle bracket to the inside of the rack, below the marked spot, as shown in Figure 1-2.**

- a. **If your rack does not have threaded holes, place cage nuts over the holes before you attach the angle brackets.**
- b. **Align the edge of the brackets to the rack as follows:**
 - If the interior of the rack contains horizontal bracket supports, align the angle bracket with the horizontal bracket support.
 - If the interior of the rack does not contain horizontal bracket supports, brace the angle bracket between the side rails.

You must orient the brackets that support the hardware platform as shown in Figure 1-2. Ensure that you can adjust the bracket vertically along its slots before you secure it.

- c. **Insert two 10-32 screws through each bracket's slotted holes, and into the holes in the supports of the rack. Do *not* tighten the screws.**
- d. **Adjust each bracket vertically along the bracket slots until the bracket is 1.2 in. (3.1 cm) below the center of one hole in the front vertical support of the rack.**
- e. **Tighten the screws with a screwdriver until secure.**

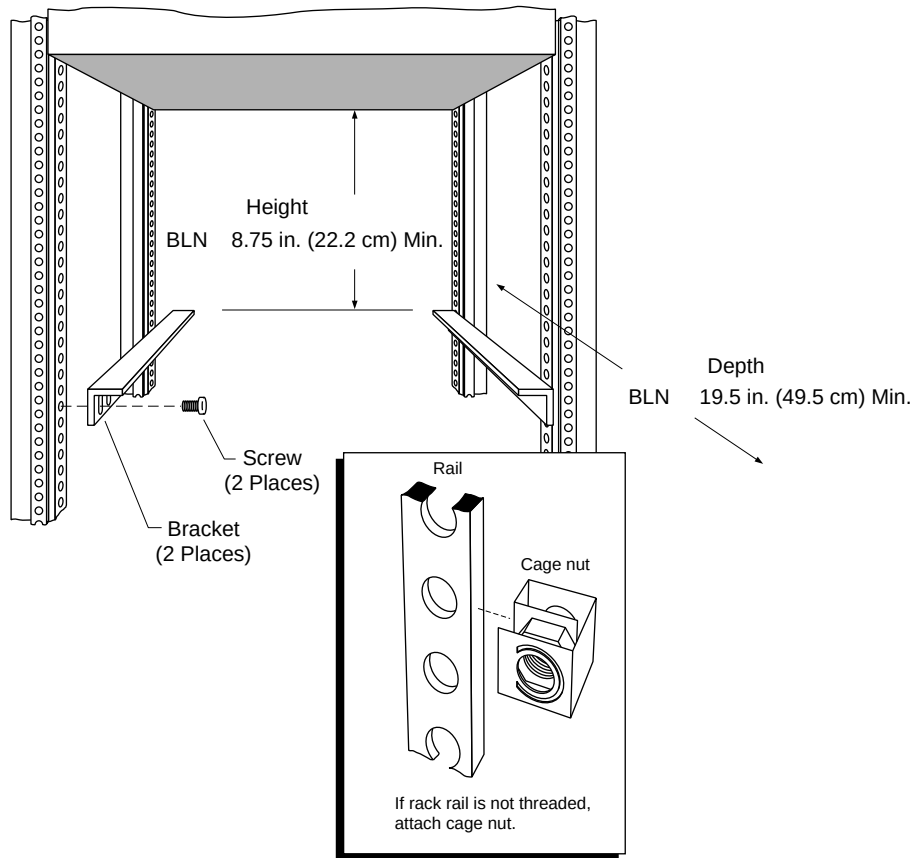


Figure 1-2. Attaching Angle Brackets to Support the BLN

Installing the BLN

This section describes how to install the BLN in an electronic enclosure rack.

You need the following equipment to install the BLN:

- The BLN hardware package that contains the panel-mount screws and cage nuts
- Phillips screwdriver

Install the BLN in the rack as follows:



Note: Before you place the BLN in the rack, ensure that the rack holes are threaded. If they are not threaded, place cage nuts over the front vertical support holes.

1. **Using both hands, pull the bottom of the front bezel toward you and remove it from the chassis (Figure 1-3).**

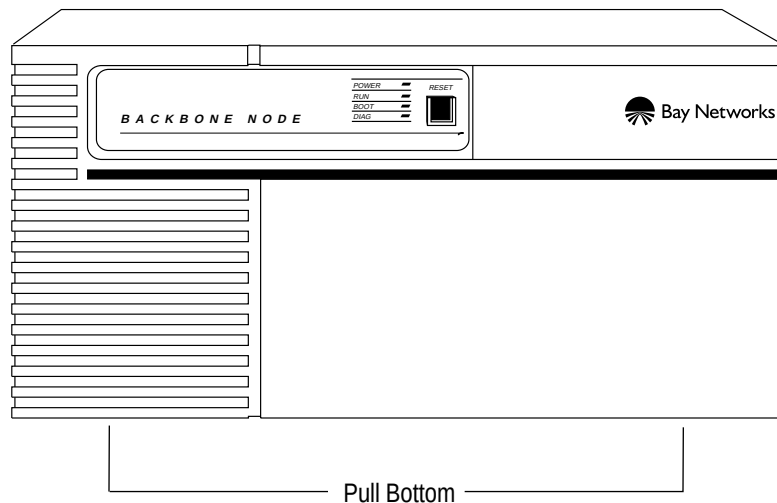


Figure 1-3. Removing the Front Bezel from the BLN

2. **Insert the BLN in the rack as shown in Figure 1-4.**

When using angle brackets for added support, place the BLN squarely on the angle brackets.

3. **Insert and tighten the screws with a screwdriver until secure.**

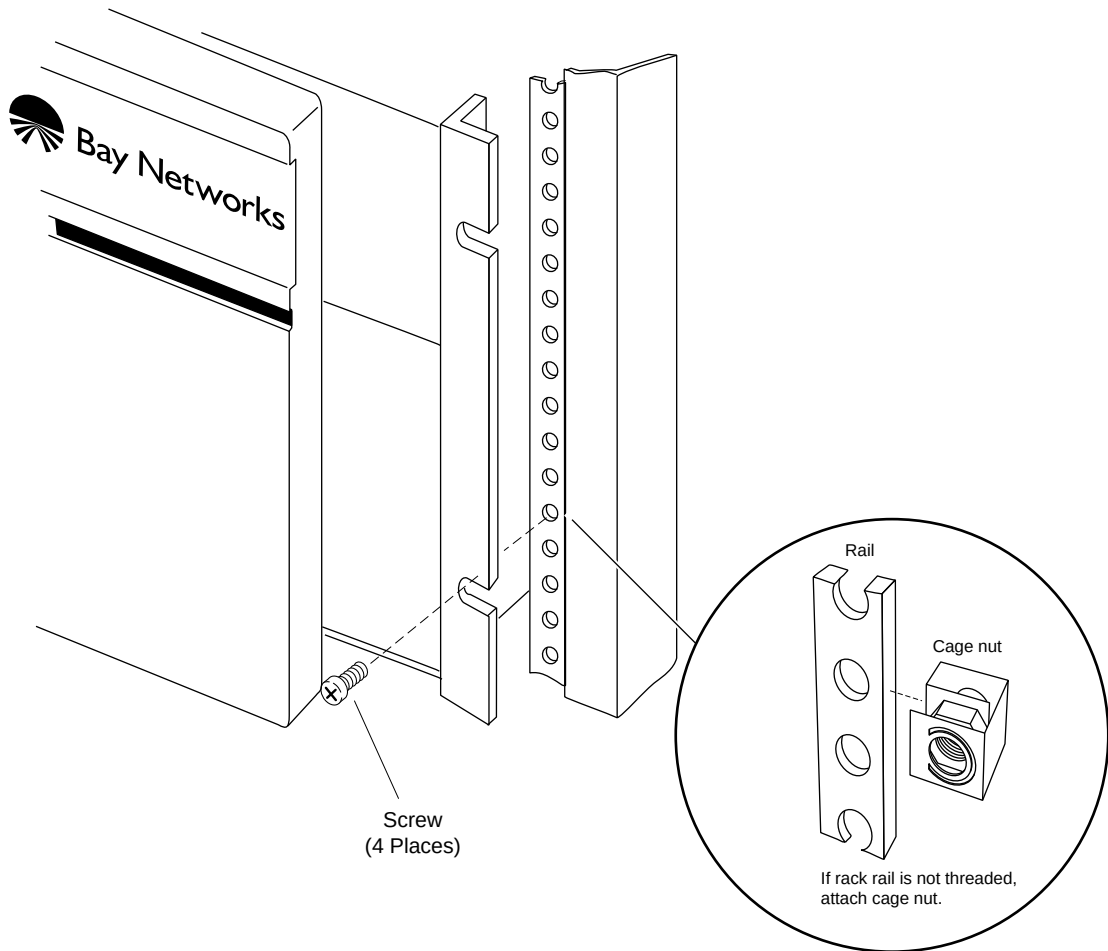


Figure 1-4. Mounting the BLN to the Rack

Replace the front bezel as follows:

1. **Align the mounting retainers on the inside of the bezel with the holes on the front of the electromagnetic compatibility (EMC) shield.**
2. **Push the sides of the bezel into place.**

Powering On the BLN

Power on the BLN as follows:

1. **Ensure that the power switch on the rear panel is in the OFF position.**
2. **Connect the power cable to the power switch assembly on the BLN rear panel.**
3. **Insert the power plug into the appropriate wall receptacle (refer to “Electrical Requirements” earlier in this chapter).**
4. **Turn the power switch to the ON position.**

The fans in the BLN start to spin.

5. **Verify that air is flowing from the cooling fans by passing your hand along the left side of the BLN to feel the air movement.**



Note: If you cannot feel air flow from the vents, if the POWER and DIAG LEDs remain off, or if the DIAG LED does not turn on, turn the BLN power switch to the OFF position. Wait 1 minute and then turn the power switch to the ON position. If the problem persists, contact the Bay Networks Technical Response Center.

After you power on the BLN, each routing engine automatically initiates a diagnostic test to verify proper board function.

LED Activation Sequence

The LEDs on the front panel of the BLN (Figure 1-5) activate while the BLN initializes and runs through its diagnostic test.

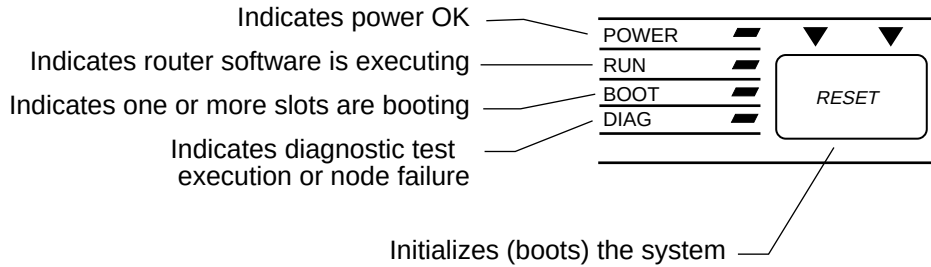


Figure 1-5. BLN Front-Panel LEDs

The LEDs typically activate in the following order (the sequence may vary slightly or overlap):

1. The POWER and DIAG LEDs turn on.

- When on, the POWER LED indicates that the power supply voltages are all within normal limits.
- When on, the DIAG LED indicates diagnostic testing on one or more modules. After a successful test, the DIAG LED turns off. The DIAG LED remains on if a diagnostic test does not end successfully for any given slot.

2. The BOOT and RUN LEDs turn on.

- When on, the BOOT LED indicates the initialization and loading of software by one or more modules.
- When on, the RUN LED indicates that system software is running on one or more modules. The RUN LED remains on while the BLN is operating normally.

The BLN indicates a successful start-up by turning off the BOOT LED. The POWER and RUN LEDs remain on. Refer to Chapter 6, “Switches and LEDs,” for a complete explanation of all Backbone Node LEDs. To activate the BLN on your IP network, refer to *Quick-Starting Routers and BNX Platforms* (router software), or to *Configuring an Interface for Network Management* (BayStream software).

Establishing a Local or Remote Connection to the BLN

You can cable a BLN to an ANSI console or a PC to establish a local Technician Interface session, or to a modem to establish a remote session.

Local Connection

Cable the BLN to an ANSI console as follows:

1. **Power on the console and set its operating parameters as shown in Table 1-8.**

Refer to your console user manual for instructions on how to set these operating parameters.

Table 1-8. Console Operating Parameters

Parameter	Value
Baud rate	9600
Data bits	8
Stop bits	1
Parity	None

2. **Insert the male end of the cable (Order No. 7525) into the CONSOLE port of the System Resources Module-Link (SRM-L) Module (Figure 1-6).**

The SRM-L resides in Slot 1 of the rear panel.

3. **Insert the female end of the cable into the ANSI console communications port.**

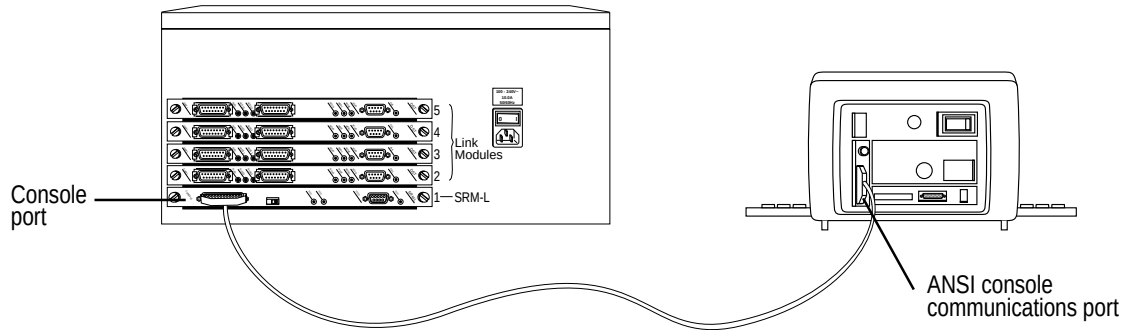


Figure 1-6. Cabling the BLN to a Console

Remote Connection

This section describes how to cable your BLN to a modem for remote dial-in access.



Note: Before you replace the local console connection with a modem connection, you must use the Technician Interface to configure the BLN initial IP network interface. To activate the BLN on your IP network refer to *Quick-Starting Routers and BNX Platforms* (router software), or to *Configuring an Interface for Network Management* (BayStream software).

Cable the BLN to the modem as follows:

- 1. Power on and configure the modem as shown in Table 1-9.**

Refer to the modem user documentation for instructions on configuring your modem.

Table 1-9. Modem Operating Parameters

Parameter	Setting
Baud rate	9600 or less
Auto answer	Set on n rings with DTR active (n must be greater than 0)
Clear to Send (CTS) signal	Always ON

(continued)

Table 1-9. Modem Operating Parameters *(continued)*

Parameter	Setting
Data Terminal Ready (DTR) signal	DTR signal fail-disconnect enabled (return to command mode, auto-answer off)
Data Carrier Detect (DCD) signal	DCD signal on while carrier present (the node uses DCD to detect modem disconnect)
Local character echo	OFF
Supervisory functions	OFF
Data Set Ready (DSR) signal	ON

2. Remove the cable connector from the CONSOLE port of the System Resource Module-Link (SRM-L).

The SRM-L is in Slot 1 of the BLN's rear panel (Figure 1-6).

3. Insert one end of the cable (Order No. 77850) into the SRM-L CONSOLE port.



Note: The console cable and the modem cable both connect to the BLN using the CONSOLE port.

4. Insert the other end of the cable into the RS-232 communications port at the back of the modem.

To configure the BLN CONSOLE port for modem operation, refer to *Configuring Routers* (router software) or *Getting Started with Site Manager* (BayStream software).

Chapter 2

Installing the Backbone Link Node-2

You install the Backbone Link Node-2 (BLN-2) hardware platform by

- Preparing for installation
- Setting up the BLN-2
- Powering up the BLN-2 and observing the hardware platform as it initializes
- Cabling a console or modem to the BLN-2 to establish a Bay Networks Technician Interface session



Note: This chapter describes how to install the AC version of the BLN-2. Only qualified service personnel are permitted to connect the DC version of the BLN-2 to a power source.



Danger: Due to high-energy hazards, only qualified service personnel with written authorization from Bay Networks are permitted to repair a BLN-2. Chapter 5, “Hot -Swapping Hardware Components,” describes user-serviceable procedures.

The BLN-2 is not designed for use with an I.T. power system (a power distribution system that has no direct connection to earth); the exposed conductive parts of the BLN-2 are grounded.



Caution: Inspect all items for any shipping damage. In particular, ensure that the ports on the rear panel are not damaged. If you detect any damaged or missing items, do not attempt to install the BLN-2. Contact the Bay Networks Technical Response Center.

Backbone Link Node-2 Overview

The BLN-2 is a multiprotocol hardware platform and bridge designed to satisfy the high-performance availability requirements of mission-critical backbone internetworks. These networks transport information using communications subsystems and protocols such as:

- Fiber Distributed Data Interface (FDDI)
- Point-to-Point Protocol (PPP)
- Systems Network Architecture (SNA)

The BLN-2 ([Figure 2-1](#)) uses a symmetric multiprocessor architecture with Fast Routing Engine (FRE and FRE-2) processor modules, or ATM Routing Engine (ARE) processor modules, along with the Bay Networks 1-Gb/s Parallel Packet Express (PPX) processor interconnect. The BLN-2 supports four routing engine modules and up to 16 LAN/WAN interfaces (up to four FDDI).

The BLN-2 hardware platform features redundant power supplies and cooling fans.

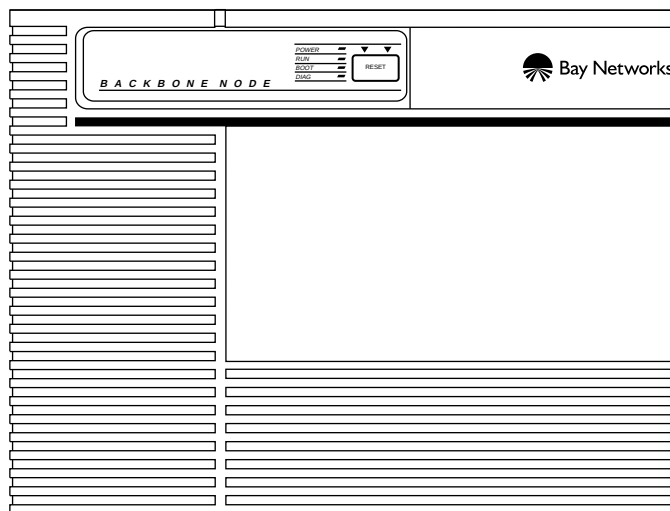


Figure 2-1. Backbone Link Node-2 (BLN-2)

Preparing for Installation

To prepare for the BLN-2 installation, verify the following:

- Your BLN-2 shipment arrived complete and undamaged
- You have the proper tools and equipment
- Your installation site meets all BLN-2 site requirements

These requirements are described in detail in the next sections.

Shipment Contents

Verify that the items in the BLN-2 shipment match the items on the packing list affixed to the shipping container ([Table 2-1](#)).

Table 2-1. BLN-2 Shipment Contents

Item	Quantity
Backbone Link Node-2	1
Site Manager Application Software (diskettes or CD-ROM)	1
System software memory card (installed in unit)	1
Hardware package for attaching angle brackets to the electronic enclosure rack (required):	
– Rack-mount brackets	2
– 10-32 x 0.5-in. panel-mount screws	4
– 10-32 cage nuts	4
Hardware package for mounting BLN-2 in an electronic enclosure rack:	
– 10-32 x 0.5-in. panel-mount screws	8
– 10-32 cage nuts	8
Power cords	2
Optional: Shielded console cable	1

Cables

Make sure that you received the correct cables with your shipment. If you plan to build your own cables, or if you want to order additional cables, refer to *Cable Guide for Routers and BNX Platforms* (router software) or *Cable Guide* (BayStream software).

Additional Equipment

You need to supply the additional equipment listed in Table 2-2.

Table 2-2. Tools and Equipment You Supply

Item	Quantity
ANSI console or PC (for establishing a Bay Networks Technician Interface session)	1
Optional: 25-pin male to 9-pin female cable adaptor (needed only if you want to cable a PC directly to BLN-2 to establish a local connection)	1
SPARCstation, PC, IBM RS/6000, or HP 9000 (for the Site Manager interface application, if not already installed)	1
A shielded console cable (only if you did not order one separately from Bay Networks)	1
An electronic enclosure rack to mount the BLN-2; rack must meet these requirements: – Heavy-duty steel construction – Electronic Industries Association (EIA) standards – Standard hole spacing – Width: 19 in. (48.3 cm) – Depth: 24 in. (61.0 cm) Any electronic enclosure rack panels or doors must contain louvers or screens to prevent overheating.	1
Tape measure	1
Phillips screwdriver	1

Site Requirements

To obtain satisfactory BLN-2 performance, your site must meet all of the following electrical, space, and environmental requirements.



Caution: Failure to adhere to these requirements may result in poor equipment performance.

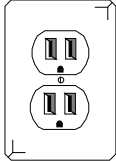
Electrical Requirements

Your installation site must provide a power source that meets the electrical requirements listed below:

- 12 A @ 110 V
- 6 A @ 230 V

Locate the BLN-2 within 6 ft (1.83 m) of a wall receptacle. Table 2-3 lists the type of wall receptacle a BLN-2 requires.

Table 2-3. Wall Receptacle Requirements

Country	Receptacle	Voltage	Branch Current
United States or Canada	National Electrical Manufacturers Association (NEMA) 5-15R standard receptacle. 	100 to 120 volts	15 A
Other countries	Your BLN-2 distributor supplies the proper cord. It is shipped with the unit from the factory.	200 to 240 volts	10 A

Space Requirements

Make sure the installation site is large enough for the BLN-2 and provides sufficient air plenum (a volume of free space surrounding the BN for heat exhaust). Table 2-4 lists the dimensions of the BLN-2.

Table 2-4. BLN-2 Dimensions

Height	Depth	Width
14 in. (35.6 cm)	22.9 in. (58.2 cm)	17.3 in. (44.0 cm)

Table 2-5 lists the number of British thermal units (Btus) generated by the BLN-2 and the air plenum requirements.

Table 2-5. BLN-2 Thermal Output and Air Plenum Requirements

Thermal Output (Maximum Btu/hr)	Location of Air Plenum	Minimum Required Air Plenum
2600	Right	2 in. (5.1 cm)
	Left	2 in. (5.1 cm)
	Front	1 in. (2.5 cm)

Table 2-6 lists the total space needed (dimensions plus air plenum requirements) for the BLN-2.

Table 2-6. Total Space Required for BLN-2

Height	Depth	Width
15.8 in. (40.0 cm)	22.9 in. (58.2 cm)	21.3 in. (54.1 cm)

Environmental Requirements

The installation site must meet the environmental requirements listed in Table 2-7.

Table 2-7. Environmental Requirements

Altitude	Humidity	Temperature
0 to 8000 ft (0 to 2400 m)	10% to 90% noncondensing	0°C to 40°C (32°F to 104°F)

Setting Up the Backbone Link Node-2

You must install your BLN-2 in an electronic enclosure rack.



Caution: Before you set up your BLN-2, refer to “Space Requirements” earlier in this chapter to verify that adequate space exists for heat exhaust.

Attaching Angle Brackets

We highly recommend that you place your hardware platform on angle brackets for added support when installing your BLN-2 in a rack. You need the following equipment to attach the angle brackets:

- The hardware package containing the angle brackets, panel-mount screws, and cage nuts
- Tape measure
- Phillips screwdriver
- Pen or pencil

Attach the angle brackets to the rack as follows:

1. **To ensure that the slots in the BLN-2 flanges align with the holes in the rack:**
 - a. **Measure at least 15.75 in. (40 cm) of free vertical space inside the rack and mark the spot.**

- b. Locate the next two holes below this spot that have a 0.625-in. space between them.**



Note: The hole pattern shown in Figure 2-2 repeats on the rail.

- 2. Mount the angle brackets in the area indicated by Figure 2-3.**
 - a. If your rack does not have threaded holes, place cage nuts over the holes before you attach the angle brackets.**
 - b. Align the edge of the brackets to the rack as follows:**
 - If the interior of the rack contains horizontal bracket supports, align the angle bracket with the horizontal bracket support.
 - If the interior of the rack does not contain horizontal bracket supports, brace the angle bracket between the side rails.

You must orient the brackets that support the hardware platform as shown in Figure 2-3. Ensure that you can adjust the bracket vertically along its slots before you secure it.

 - c. Insert two 10-32 screws through each bracket's slotted holes and into the holes in the supports of the rack. Do not tighten the screws.**
 - d. Adjust each bracket vertically along the bracket slots until the bracket is 1.4 in. (3.6 cm) below the center of one hole in the front vertical support of the rack.**
 - e. Tighten the screws with a screwdriver until secure.**

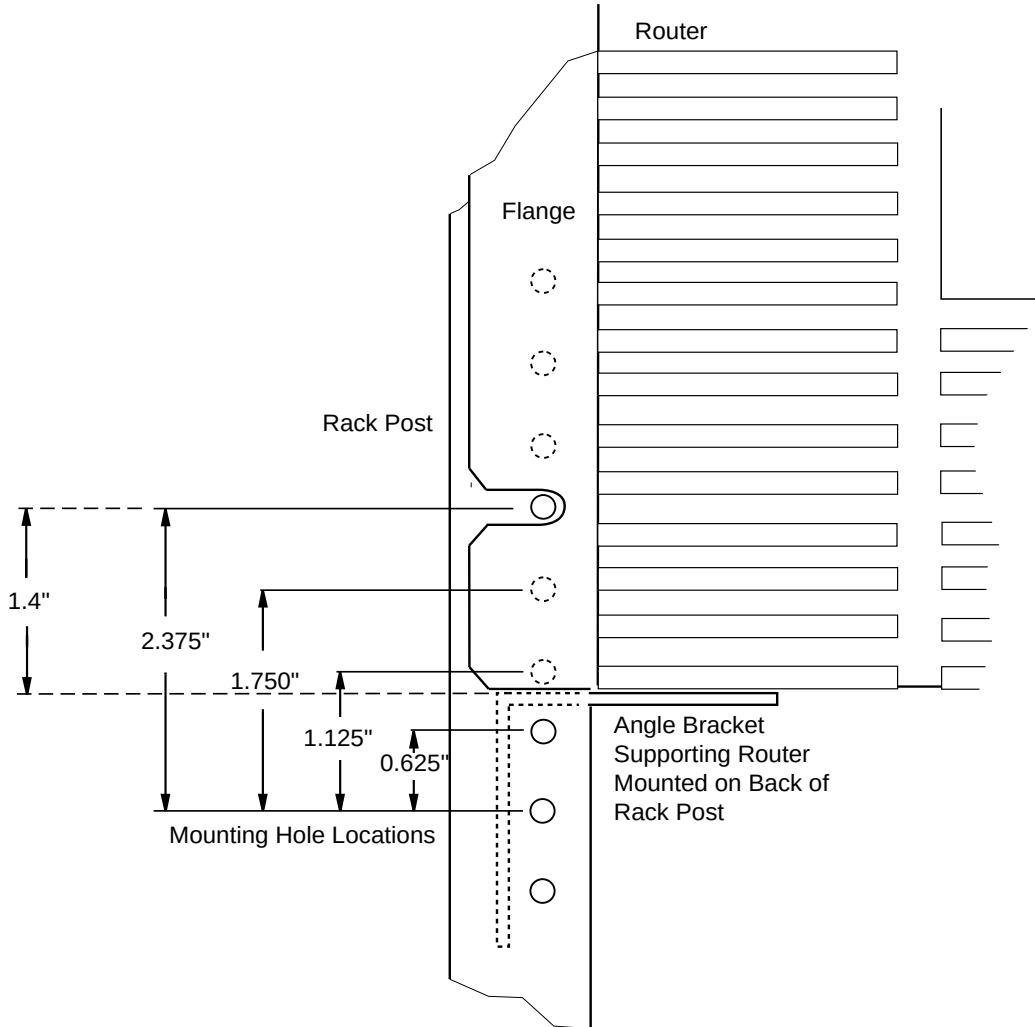


Figure 2-2. Locating the Mounting Holes

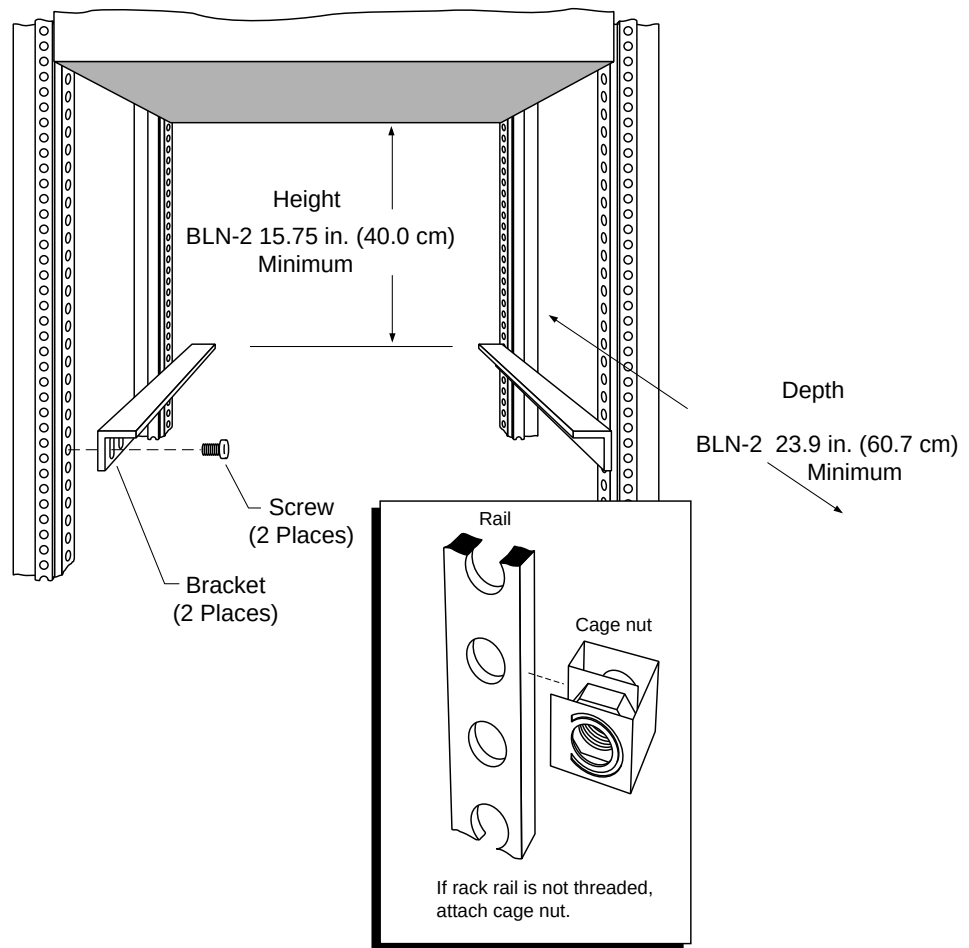


Figure 2-3. Attaching Angle Brackets to Support the BLN-2

Installing the BLN-2



Warning: The BLN-2 weighs approximately 125 lb. Do not attempt to lift it by yourself. Use a team of people or specialized lifting equipment. Before inserting the BLN-2 in the rack, ensure that all equipment already inside the rack is secure.

Install the BLN-2 in the electronic enclosure rack as follows:

1. Using both hands, pull the bottom of the front bezel toward you and remove it from the chassis ([Figure 2-4](#)).

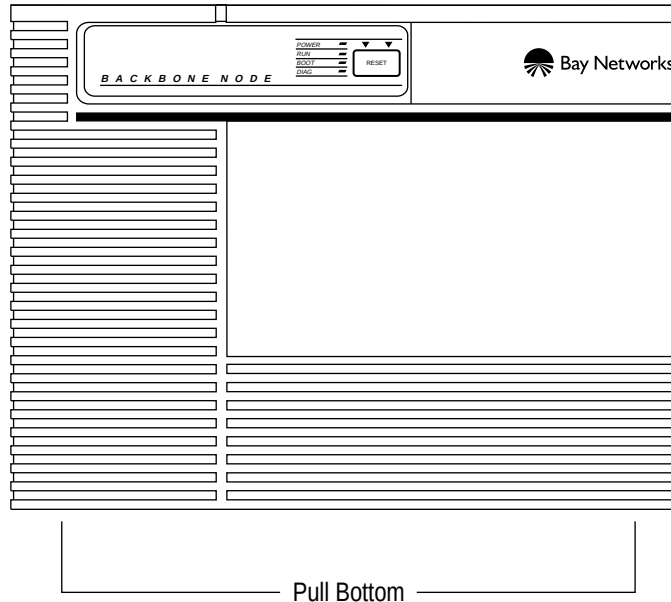


Figure 2-4. Removing the Front Bezel from the BLN-2



Note: Before you place the BLN-2 in the rack, ensure that the rack holes are threaded. If they are not threaded, place cage nuts over the front vertical support holes.

2. **Insert the BLN-2 in the rack as shown in Figure 2-5. Make sure the BLN-2 rests squarely on the angle brackets.**
3. **Insert and tighten the screws with a screwdriver until secure.**

Replace the front bezel as follows:

1. **Align the mounting retainers on the inside of the bezel with the holes on the front of the electromagnetic compatibility (EMC) shield.**
2. **Push the sides of the bezel into place.**

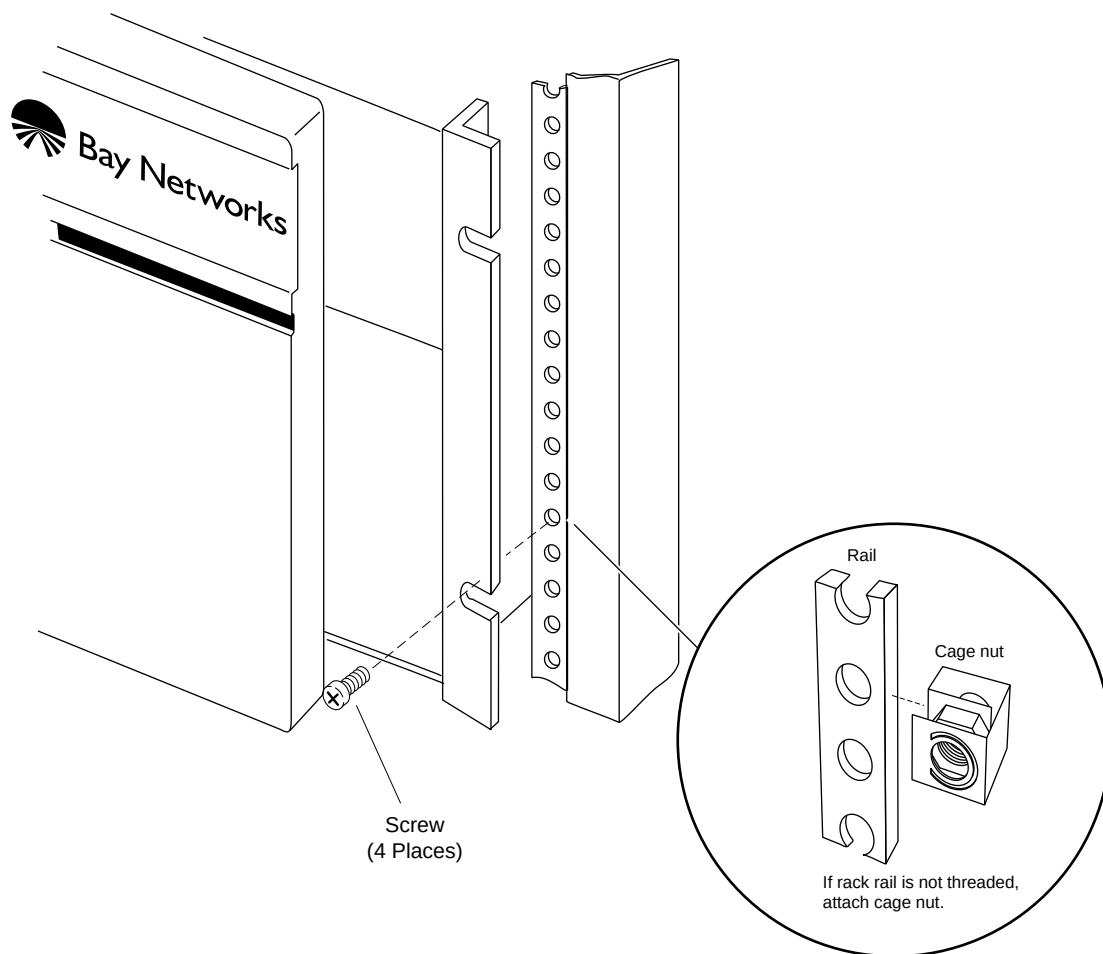


Figure 2-5. Mounting the BLN-2 to the Rack

Powering On the BLN-2

Power on the BLN-2 as follows:

1. **Ensure that the power switches on the rear panel are in the OFF position.**
2. **Connect the power cables to the power switch assembly on the BLN-2 rear panel.**



Note: The BLN-2 has two power supplies, so remember to plug in the cables and turn on the switches on both.

Inserting the BLN-2 power cables into separate branch circuits allows for redundant AC power. For additional information about BLN-2 power supplies, refer to Chapter 5, “Hot-Swapping Hardware Components.”

3. **Insert the power plugs into their appropriate wall receptacles (refer to “Electrical Requirements” earlier in this chapter).**
4. **Turn the power switches to the ON position.**
5. **Verify that air is flowing from the cooling fans and out through the vents on either side of the BLN-2.**



Note: If you cannot feel air flow from the BLN-2 vents, if the POWER and DIAG LEDs remain off, or if the DIAG LED remains on, turn the power switch at the rear of the BLN-2 to the OFF position. Wait 1 minute and then turn the power switch to the ON position. If the problem persists, contact the Bay Networks Technical Response Center.

After you power on the BLN-2, each routing engine automatically initiates a diagnostic test to verify proper board function.

LED Activation Sequence

The LEDs on the front panel of the BLN-2 ([Figure 2-6](#)) activate while the BLN-2 initializes and runs through its diagnostic tests.

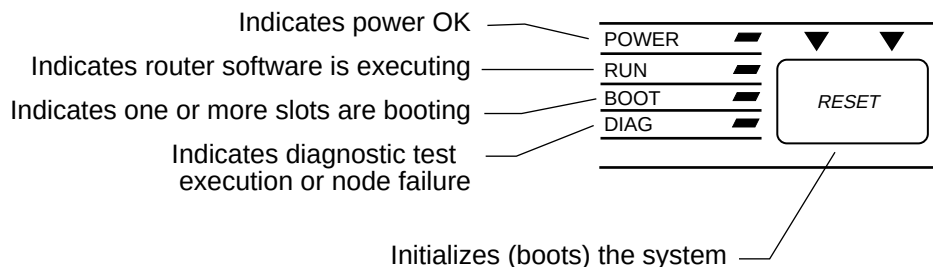


Figure 2-6. BLN-2 Front-Panel LEDs

The LEDs typically activate in the following order (the sequence may vary slightly or overlap):

1. The POWER and DIAG LEDs turn on.

- When on, the POWER LED indicates that the power supply voltages are all within normal limits.
- When on, the DIAG LED indicates diagnostic testing on one or more modules. After a successful test, the DIAG LED turns off. The DIAG LED remains on if a diagnostic test does not end successfully for any given slot.

2. The BOOT and RUN LEDs turn on.

- When on, the BOOT LED indicates the initialization and loading of software by one or more modules.
- When on, the RUN LED indicates that system software is running on one or more modules. The RUN LED remains on while the BLN-2 is operating normally.

The BLN-2 indicates a successful start-up by turning off the BOOT LED. The POWER and RUN LEDs remain on. Refer to Chapter 6, “Switches and LEDs,” for a complete explanation of all LEDs. To activate the BLN-2 on your IP network refer to *Quick-Starting Routers and BNX Platforms*, or to *Configuring an Interface for Network Management* (BayStream software).

Establishing a Local or Remote Connection to the BLN-2

You can cable a BLN-2 to an ANSI console or a PC to establish a local Technician Interface session, or to a modem to establish a remote session.



Note: *Bay Networks offers the cables for console connection.* To activate the BLN on your IP network refer to *Quick-Starting Routers and BNX Platforms* (router software), or to *Configuring an Interface for Network Management* (BayStream software).

Local Connection

Cable the BLN-2 to an ANSI console as follows:

1. **Power on the console and set its operating parameters as shown in Table 2-8.**

Refer to your console user manual for instructions on how to set these operating parameters.

Table 2-8. Console Operating Parameters

Parameter	Value
Baud rate	9600
Data bits	8
Stop bits	1
Parity	None

2. **Insert the male end of the cable (Order No. 7525) into the CONSOLE port of the System Resources Module-Link (SRM-L) (Figure 2-7).**

The SRM-L resides in Slot 1 of the rear panel.

3. **Insert the female end of the cable into the ANSI console communications port.**

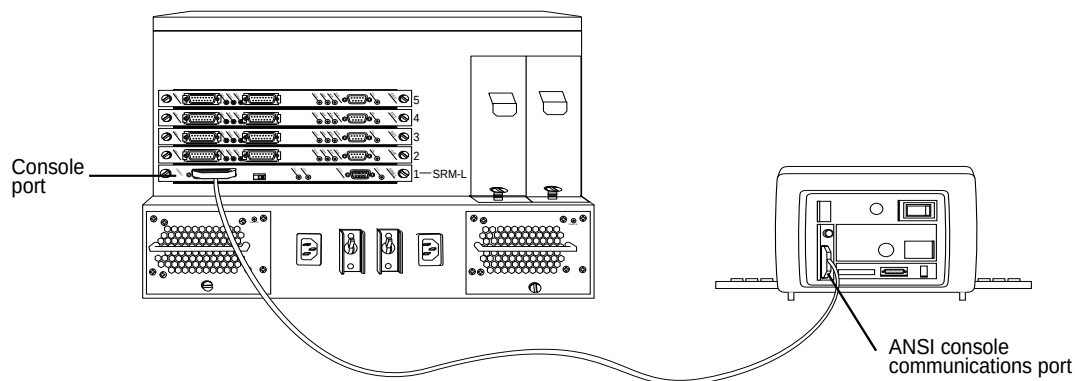


Figure 2-7. Cabling the BLN-2 to a Console

Remote Connection



Note: Before you replace the local console connection with a modem connection, you must use the Technician Interface to configure the BLN-2 initial IP network interface. Refer to *Quick-Starting Routers and BayStream Platforms* for instructions.

Cable the BLN-2 to the modem as follows:

1. **Power on and configure the modem as shown in Table 2-9.**

Refer to the modem user documentation for instructions on configuring your modem.

Table 2-9. Modem Operating Parameters

Parameter	Setting
Baud rate	9600 or less
Auto answer	Set on n rings with DTR active (n must be greater than 0)
Clear to Send (CTS) signal	Always ON

Table 2-9. Modem Operating Parameters *(continued)*

Parameter	Setting
Data Terminal Ready (DTR) signal	DTR signal fail-disconnect enabled (return to command mode, auto-answer off)
Data Carrier Detect (DCD) signal	DCD signal on while carrier present (the node uses DCD to detect modem disconnect)
Local character echo	OFF
Supervisory functions	OFF
Data Set Ready (DSR) signal	ON

2. Remove the cable connector from the CONSOLE port of the System Resource Module-Link (SRM-L).

The SRM-L resides in Slot 1 of the BLN-2 rear panel (Figure 2-7).

3. Insert one end of the modem cable (Order No. 77850) into the SRM-L CONSOLE port.



Note: The console cable and the modem cable both connect to the BLN-2 using the CONSOLE port.

4. Insert the other end of the cable into the RS-232 communications port on the back of the modem.

To configure the BLN CONSOLE port for modem operation, refer to *Configuring Routers* (router software) or *Getting Started with Site Manager* (BayStream software).

Chapter 3

Installing the BCN and BCN RLC

You install the Backbone Concentrator Node (BCN) by

- Preparing for installation
- Setting up the BCN
- Powering up the BCN and observing the hardware platform as it initializes
- Cabling a console or modem to the hardware platform for access to the Bay Networks Technician Interface



Note: This chapter describes how to install the Single AC Source (BCN) and Dual AC Source (BCN RLC) versions. The BCN and the BCN RLC are both referred to as BCN except where a differentiation is necessary. Only qualified service personnel are permitted to connect the DC version of the BCN to a power source. See *Installing the DC Version of the BCN and BLN-2*.



Danger: Due to high-energy hazards, only qualified service personnel are permitted to repair a Backbone Concentrator Node. Chapter 5, “Hot-Swapping Hardware Components,” describes user-serviceable procedures.

The BCN is not designed for use with an I.T. power system (a power distribution system that has no direct connection to earth); the exposed conductive parts of the BCN are grounded.



Warning: The BCN weighs approximately 214 lb (97.07 kg). Do not attempt to lift it by yourself. Use a team of people or specialized lifting equipment.



Caution: Inspect all items for any shipping damage. In particular, ensure that the ports on the rear panel are not damaged. If you detect any damaged or missing items, do not attempt to install the BCN. Contact the Bay Networks Technical Response Center.

Backbone Concentrator Node Overview

The BCN is a multiprotocol router/bridge designed to satisfy the high-performance availability requirements of the most demanding, mission-critical backbone internetworks. These networks transport information using communications subsystems and protocols such as:

- Fiber Distributed Data Interface (FDDI)
- T1/T3 synchronous lines
- Asynchronous Transfer Mode (ATM)
- Systems Network Architecture

The BCN ([Figure 3-1](#)) uses a symmetric multiprocessor architecture with Fast Routing Engine (FRE or FRE-2) processor modules, or ATM Routing Engine (ARE) processor modules, along with the Bay Networks 1 Gb/s Parallel Packet Express (PPX) processor interconnect. This combination delivers industry-leading performance.

The BCN supports up to 13 ILI sets. The BCN RLC supports up to 10 ILI sets.

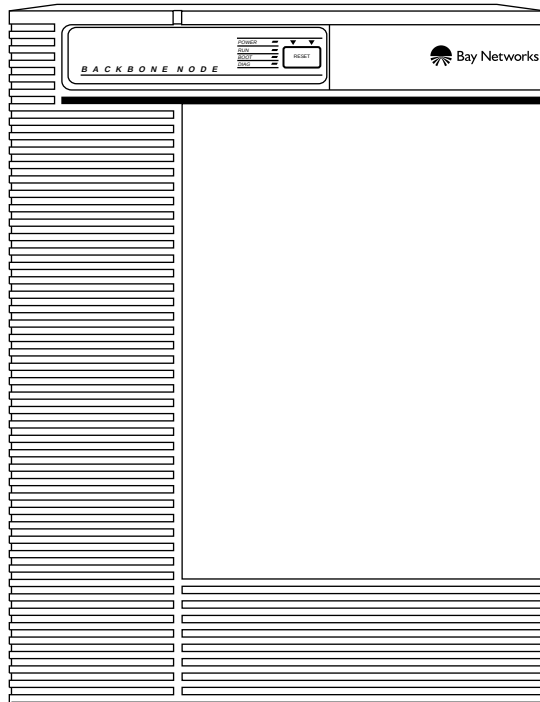


Figure 3-1. Backbone Concentrator Node (BCN)

Preparing for Installation

To prepare for the BCN installation, verify the following:

- Your BCN shipment arrived complete and undamaged
- You have the proper tools and equipment
- Your installation site meets all BCN site requirements

These requirements are described in detail in the next sections.

Shipment Contents

Verify that the items in the BCN shipment match the items on the packing list affixed to the shipping container ([Table 3-1](#)).

Table 3-1. BCN Shipment Contents

Item	Quantity
Backbone Concentrator Node	1
Site Manager Application Software (diskettes or CD-ROM)	1
System software memory card (installed in unit)	1
Hardware package for attaching angle brackets to the electronic enclosure rack:	
– Rack-mount brackets	2
– 10-32 x 0.5-in. panel-mount screws	4
– 10-32 cage nuts	4
Hardware package for mounting the BCN in an electronic enclosure rack:	
– 10-32 x 0.5-in. panel-mount screws	8
– 10-32 cage nuts	8
Antistatic wrist strap (located inside the front bezel)	1
BCN power cord, or	1
BCN RLC power cords	2
Optional: Shielded console cable	1

Cables

Make sure that you received the correct cables with your shipment. If you plan to build your own cables, or if you want to order additional cables, refer to *Cable Guide for Routers and BNX Platforms* (router software) or *Cable Guide* (BayStream software).

Additional Equipment

You need to supply the additional equipment listed in Table 3-2.

Table 3-2. Tools and Equipment You Supply

Item	Quantity
ANSI console or PC (to establish a Bay Networks Technician Interface session)	1
Optional: 25-pin male to 9-pin female cable adaptor (needed only if you want to cable a PC directly to the BCN to establish a local connection)	1
SPARCstation, PC, IBM RS/6000, or HP 9000 (for Site Manager)	1
A shielded console cable (only if you did not order one separately from Bay Networks)	1
An electronic enclosure rack in which to mount the BCN. The rack must meet the following requirements: – Heavy-duty steel construction – Electronic Industries Association (EIA) standard hole spacing – Width: 19 in. (48.3 cm) – Depth: 24 in. (61 cm) Any electronic enclosure rack panels or doors must contain louvers or screens to prevent overheating	1
Tape measure	1
5/32-in. hex wrench	1
Phillips screwdriver	1
Standard screwdriver	1

Site Requirements

To obtain satisfactory BCN performance, your site must meet all of the following electrical, space, and environmental requirements.



Caution: Failure to adhere to these requirements may result in poor equipment performance.

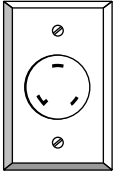
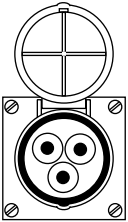
Electrical Requirements

The installation site must provide a power source that meets the following electrical requirement: 200 to 240 VAC at a maximum of 13 A @ 230 VAC.

The power required for the BCN RLC is 100 VAC to 240 VAC at a maximum of 8a @ 230 VAC and 16a @ 100 VAC.

Locate the BCN within 8 ft (2.5 m) of the wall receptacle. Table 3-3 lists the types of wall receptacles the BCN uses.

Table 3-3. Wall Receptacle Requirements

Country	Receptacle	Voltage	Branch Current
United States or Canada	National Electrical Manufacturers Association (NEMA) L6-20R standard receptacle 	208 to 220 volts	20 A
European countries	IEC 309 standard receptacle 	240 volts	16 A
Other countries	Your BCN distributor supplies the proper cord. It is shipped with the unit from the factory.	200 to 240 volts	20 A

Space Requirements

Make sure the installation site is large enough for the BCN and provides sufficient air plenum (a volume of free space surrounding the hardware platform for heat exhaust). Table 3-4 lists the dimensions of the BCN.

Table 3-4. BCN Dimensions

Height	Depth	Width
24.4 in. (62.0 cm)	22.9 in. (58.2 cm)	19 in. (48.3 cm)

Table 3-5 lists the number of British thermal units (Btus) generated by the BCN and its air plenum requirements.

Table 3-5. BCN Thermal Output and Air Plenum Requirements

Thermal Output (Maximum Btu/hr.)	Location of Air Plenum	Required Air Plenum	Recommended Air Plenum
7700	Front of BCN	2.5 in. (6.4 cm)	4 in. (10.2 cm)
	Rear of BCN	2.5 in. (6.4 cm)	4 in. (10.2 cm)
	Top of BCN	3.5 in. (9 cm)	5.25 in. (13.3 cm)
	Right of BCN	2 in. (5.1 cm)	3 in. (7.6 cm)

Table 3-6 shows the total space needed (dimensions plus air plenum requirements) for the BCN. You must ensure that the rear of the rack has at least 20 inches of additional clearance available for inserting and removing the power modules.

Table 3-6. Total Space Required for BCN

Height	Depth	Width
27.9 in. (70.9 cm)	27.9 in. (70.9 cm)	21 in. (53.3 cm)

Environmental Requirements

The installation site must meet the environmental requirements listed in Table 3-7.

Table 3-7. Environmental Requirements

Altitude	Humidity	Temperature
0 to 8000 ft (0 to 2400 m)	10% to 90% noncondensing	0°C to 40°C (32°F to 104°F)

Setting Up the Backbone Concentrator Node

You must install your BCN in an electronic enclosure rack.



Caution: Before you set up your BCN, refer to “Space Requirements” earlier in this chapter to verify that adequate space exists for heat exhaust.

Attaching Angle Brackets

We highly recommend that you place your hardware platform on angle brackets for added support when installing your BCN in a rack.

Before you begin, locate the hardware package that contains the brackets, panel-mount screws, and cage nuts. You also need a tape measure and a Phillips screwdriver.

Attach angle brackets as follows:

1. **To ensure that the slots in the BCN flanges align with the holes in the rack:**
 - a. **Measure at least 28 in. (71 cm) of free vertical space inside the rack and mark the spot.**
 - b. **Locate the next two holes below this spot that have a 0.625-in. space between them.**



Note: The hole pattern shown in Figure 3-2 repeats on the rail.

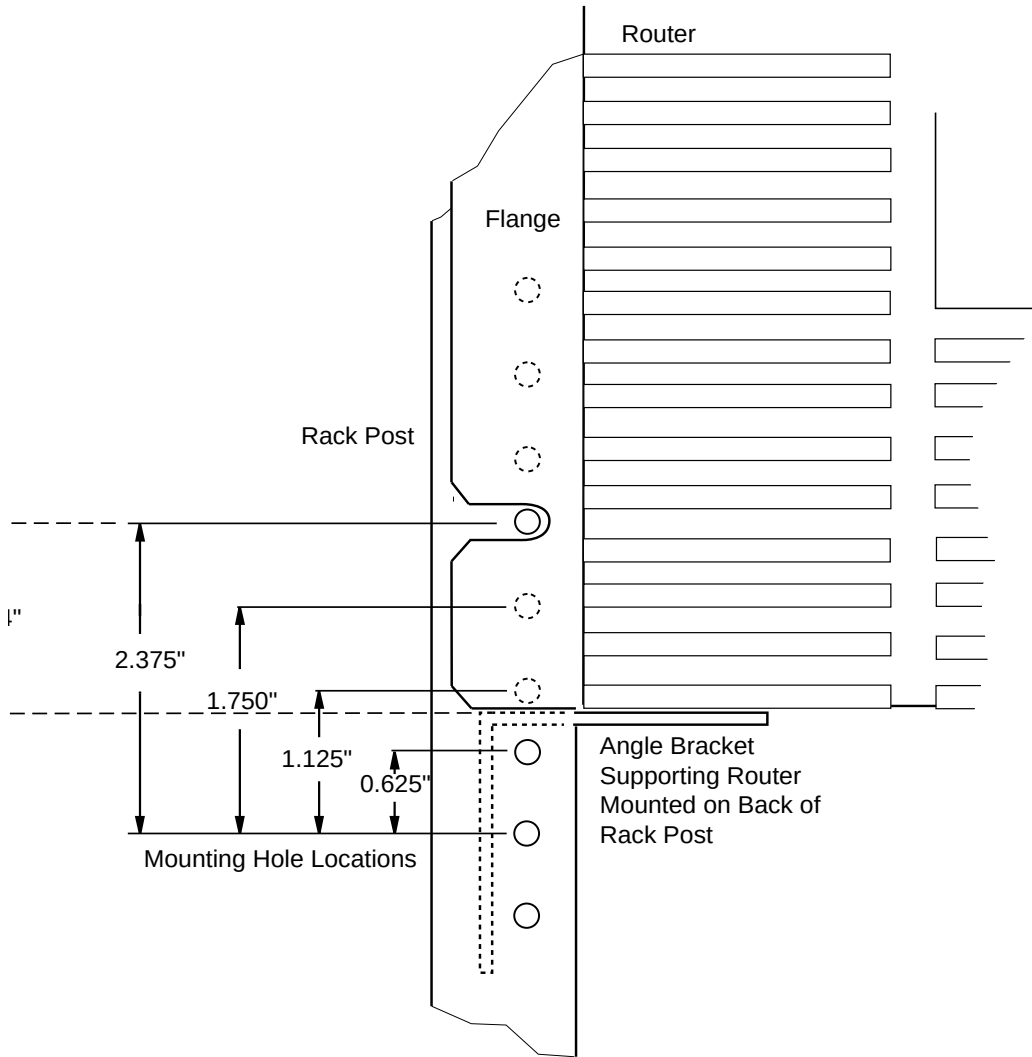


Figure 3-2. Locating the Mounting Holes

2. **Mount the angle brackets in the area indicated by Figure 3-3.**
 - a. **If your rack does not have threaded holes, place cage nuts over the holes before you attach the angle brackets.**

b. Align the edge of the brackets to the rack:

- If the interior of the rack contains horizontal bracket supports, align the angle bracket with the horizontal bracket support.
- If the interior of the rack does not contain horizontal bracket supports, brace the angle bracket between the side rails.

You must orient the brackets that support the hardware platform as shown in Figure 3-3. Ensure that you can adjust the bracket vertically along its slots before you secure it.

- c. Insert two 10-32 screws through each bracket's slotted holes and into the holes in the supports of the rack. Do not tighten the screws.**
- d. Adjust each bracket vertically along the bracket slots until the bracket is 1.4 in. (3.6 cm) below the center of one hole in the front vertical support of the rack.**
- e. Tighten the screws with a screwdriver until secure.**

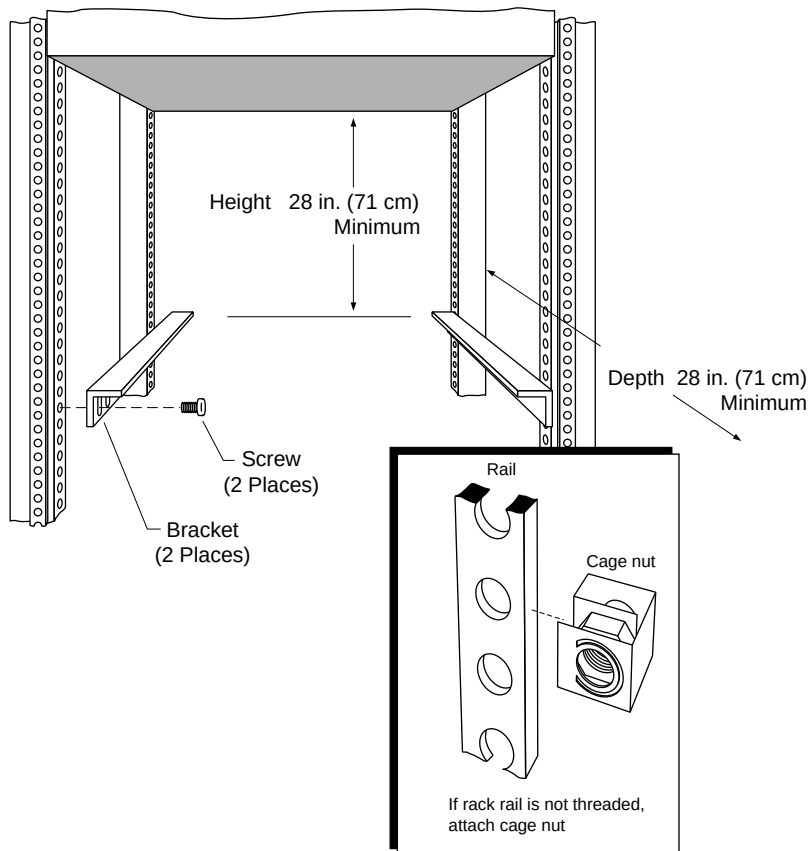


Figure 3-3. Attaching Brackets to Support the BCN

Installing the BCN



Warning: The BCN weighs approximately 214 lb (97.07 kg). Do not attempt to lift it by yourself. Use a team of people or specialized lifting equipment. Before placing the BCN in the rack, ensure that all equipment already inside the rack is secure.

Prepare the BCN for installation as follows:

1. **Remove each power module (Figure 3-4).** Removing the power modules significantly reduces the weight of the BCN. You can remove the power modules while the BCN is still on its shipping platform.
 - a. Using a flat-head screwdriver, loosen the captive screw until the power module disengages.
 - b. Grasp the handle and pull the power module out of the BCN.

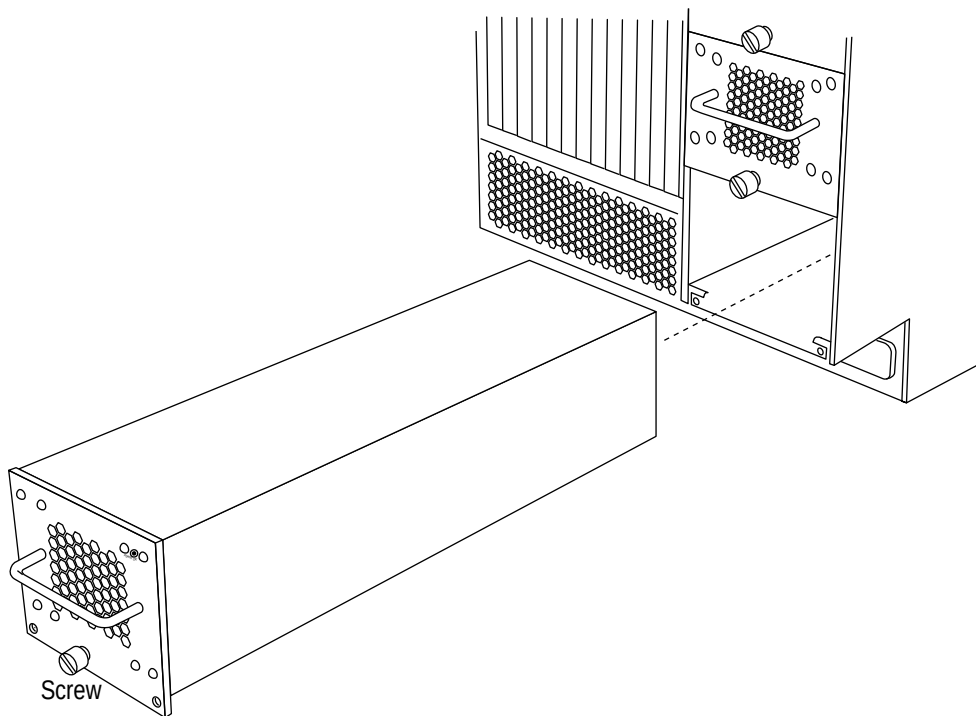


Figure 3-4. Removing a Power Module from the BCN

2. **Lift and remove the BCN from its shipping platform and place it gently on the floor.**



Caution: You can damage the front bezel if you attempt to remove it while the BCN is positioned on its shipping platform.

3. **Using both hands, pull on the top of the front bezel and remove it from the chassis** [\(Figure 3-5\)](#).

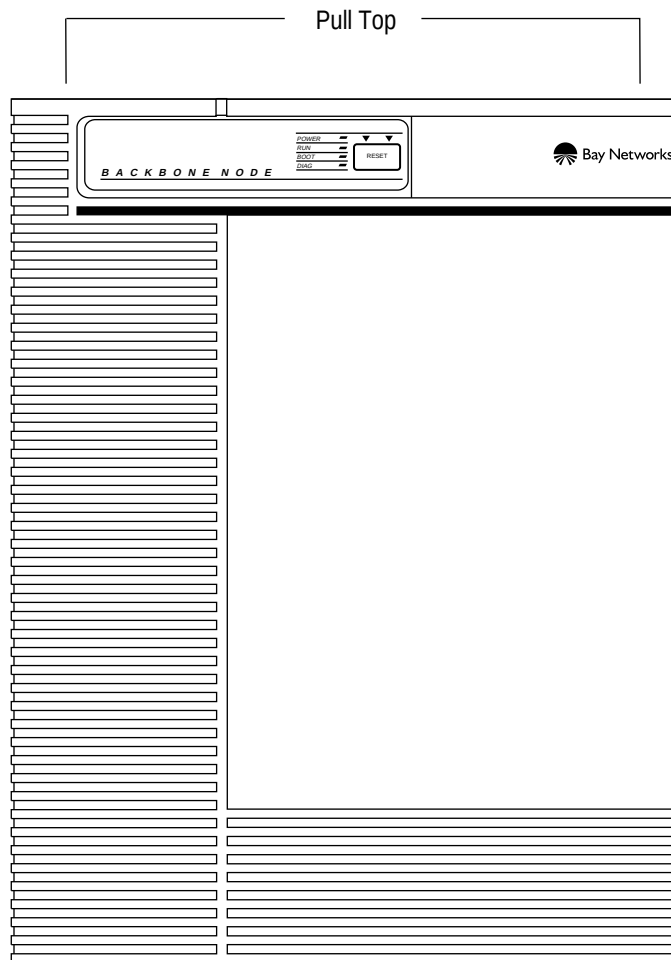


Figure 3-5. Removing the Front Bezel from the BCN

Install the BCN in the electronic enclosure rack as follows:



Note: Before putting the BCN in the rack, ensure that the rack holes are threaded. If they are not threaded, place cage nuts over the front vertical support holes.

1. **Insert the BCN in the rack as shown in Figure 3-6. Make sure the BCN rests squarely on the angle brackets.**

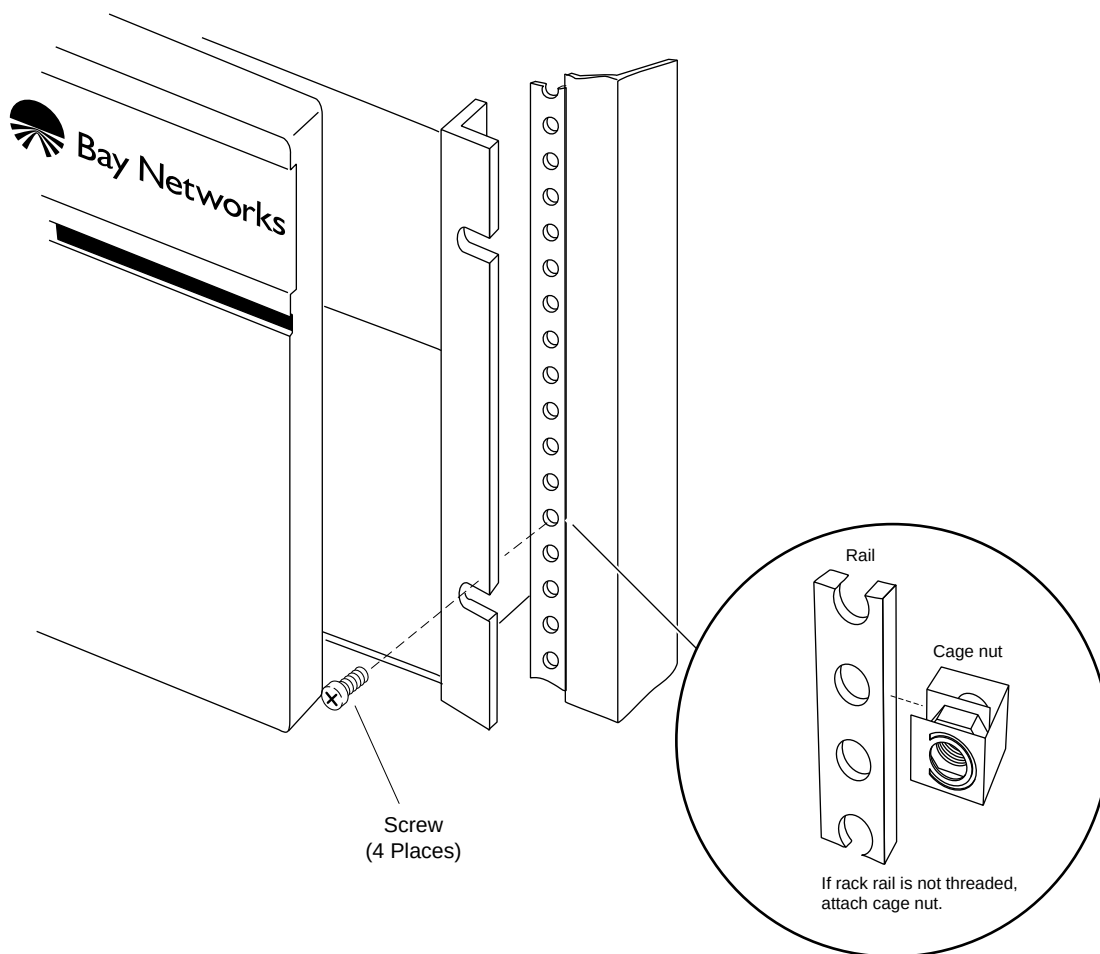


Figure 3-6. Mounting the BCN to the Rack

2. **Insert and tighten the screws with a screwdriver until secure.**

Replace the front bezel as follows:

1. **Align the mounting retainers on the inside of the bezel with the holes on the front of the electromagnetic compatibility (EMC) shield.**
2. **Push the sides of the bezel into place.**

Insert each power module as follows:

1. **Grasp the handle and guide the module into the desired slot along the side guides and *gently* insert the module until the power supply connector comes into contact with the connector on the power supply backplane.**



Note: Stop when you feel resistance. The power module does not fully insert until you tighten the thumbscrew.

2. **Using a flat-head screwdriver, turn the captive screw until the power module seats firmly.**

The Power OK LED lights when the BCN powers on and the power module fully engages.

3. **Turn the captive screw an additional 1/4 turn. Do *not* overtighten the screw.**

Powering On the BCN or BCN RLC

Power on the BCN or BCN RLC as follows:

1. **Ensure that the power switch(s) on the rear panel is in the OFF (down or 0) position.**
2. **Connect the power plug(s) to the AC inlet(s) on the BCN rear panel.**
3. **Insert the power plug(s) into the appropriate wall receptacle. Refer to “Electrical Requirements” earlier in this chapter.**
4. **Turn the power switch(s) to the ON (up or 1) position.**

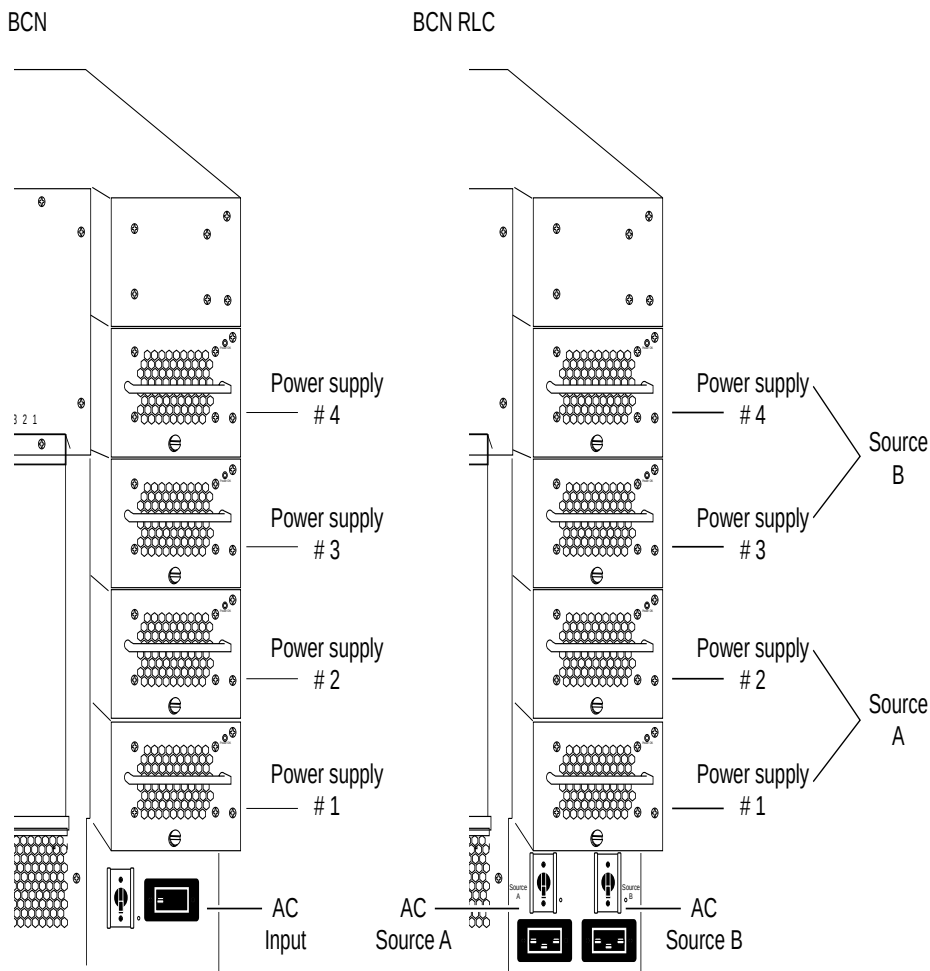


Figure 3-7. BCN and BCN RLC Power Systems



Note: For the BCN RLC, only the two bottom power supplies are powered by the Source A power cord, and only the two top power supplies are powered by the Source B power cord.

5. Verify that the POWER OK LED on each power module is on.

If an LED is not on, replace the power module. (Refer to Chapter 5, “Hot-Swapping Hardware Components,” for hot-swap procedures.)

6. **Verify that air is flowing from the cooling fans and out through the top of the BCN.**

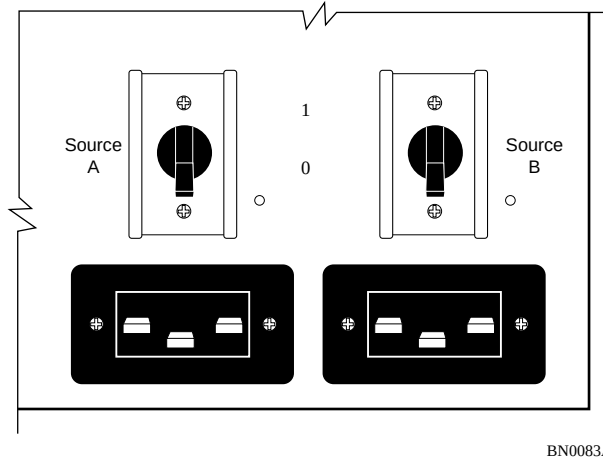


Figure 3-8. BCN RLC Power Source and Switches



Note: If you cannot feel air flow from the BCN vents, if the POWER and DIAG LEDs remain off, or if the DIAG LED remains on, turn the power switch(es) at the rear of the BCN to the OFF position. Wait 1 minute and then turn the power switch(es) to the ON position. If the problem persists, contact the Bay Networks Technical Response Center.

After you power on the BCN, each routing engine automatically initiates a diagnostic test to verify proper board function.

LED Activation Sequence

The LEDs on the front panel of the BCN ([Figure 3-9](#)) activate while the BCN initializes and runs through its diagnostic tests.

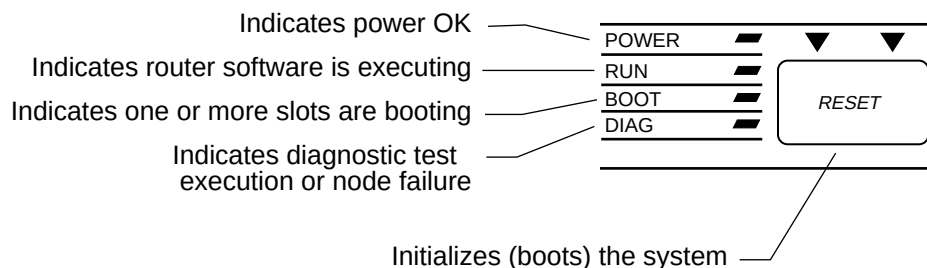


Figure 3-9. BCN Front-Panel LEDs

The LEDs typically activate in the following order (the sequence may vary slightly or overlap):

1. The POWER and DIAG LEDs turn on.

- When on, the POWER LED indicates that the power supply voltages are all within normal limits. If a power module is not operational, the POWER LED remains off. Check the power modules on the rear panel of the BCN to determine which is not operational. The Power OK LED on each power module remains on under normal operation. Ensure that the power module is firmly seated within its slot. If it is, refer to Chapter 5, “Hot-Swapping Hardware Components,” for instructions on how to replace a power module.
- For the BCN RLC, both AC Sources (A + B) must be present before the POWER LED will be on.
- When on, the DIAG LED indicates diagnostic testing on one or more modules. After a successful test, the DIAG LED turns off. The DIAG LED remains on if a diagnostic test does not end successfully for any given slot.

2. The BOOT and RUN LEDs turn on.

- When on, the BOOT LED indicates the initialization and loading of software by one or more modules.
- When on, the RUN LED indicates that system software is running on one or more modules. The RUN LED remains on while the BCN is operating normally.

The BCN indicates a successful start-up by turning off the BOOT LED. The POWER and RUN LEDs remain on. Refer to Chapter 6, “Switches and LEDs,” for a complete explanation of all Backbone Node LEDs.

To activate the BCN on your IP network, refer to *Quick-Starting Routers and BNX Platforms* (router software), or *Configuring an Interface for Network Management* (BayStream software).

Establishing a Local or Remote Connection to the BCN

You can cable a BCN to an ANSI console or a PC to establish a local Technician Interface session, or to a modem to establish a remote session.



Note: Bay Networks offers the cables for console connection. If you plan to build your own cables, or if you want to order additional cables, refer to *Cable Guide for Routers and BNX Platforms* (router software) or *Cable Guide* (BayStream software).

Local Connection

Cable the BCN to an ANSI console as follows:

1. **Power on the console and set its operating parameters as shown in Table 3-8.**

See your console user manual for instructions on how to set these operating parameters.

Table 3-8. Console Operating Parameters

Parameter	Value
Baud rate	9600
Data bits	8
Stop bits	1
Parity	None

2. **Insert the male end of the cable (Order No. 7525) into the CONSOLE port of the System Resources Module-Link (SRM-L) Module ([Figure 3-10](#)).**

The SRM-L resides in Slot 7 of the BCN rear panel.

3. **Insert the female end of the cable into the ANSI console communications port ([Figure 3-8](#)).**

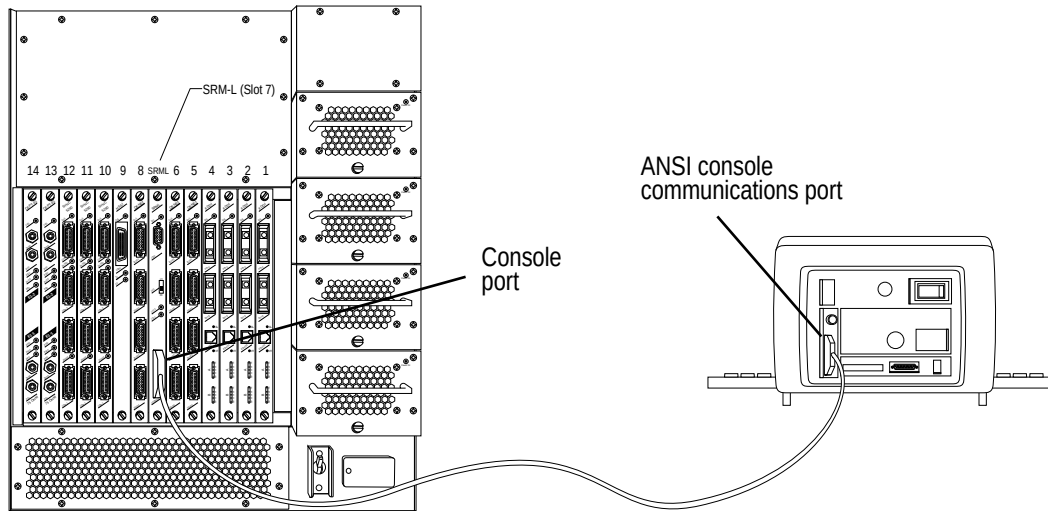


Figure 3-10. Cabling the BCN to a Console

Remote Connection



Note: Before you replace the local console connection with a modem connection, you must use the Technician Interface to configure the BCN initial IP network interface. To activate the BCN on your IP network, refer to *Quick-Starting Routers and BNX Platforms* (router software), or *Configuring an Interface for Network Management* (BayStream software).

Cable the BCN to the modem as follows:

- 1. Power on and configure the modem as shown in Table 3-9.**

Refer to the modem user documentation instructions on configuring your modem.

Table 3-9. Modem Operating Parameters

Parameter	Setting
Baud rate	9600 or less
Auto answer	Set on n rings with DTR active (n must be greater than 0)
Clear to Send (CTS) signal	Always ON
Data Terminal Ready (DTR) signal	DTR signal fail-disconnect enabled (return to command mode, auto-answer off)
Data Carrier Detect (DCD) signal	DCD signal on while carrier present (the node uses DCD to detect modem disconnect)
Local character echo	OFF
Supervisory functions	OFF
Data Set Ready (DSR) signal	ON

-
- If you have not already done so, remove the cable connector from the CONSOLE port of the System Resource Module-Link (SRM-L).**

The SRM-L resides in Slot 7 of the BCN rear panel.

-
-
- Insert one end of the modem cable (Order No. 77850) into the SRM-L CONSOLE port.**



Note: The console cable and the modem cable both connect to the BCN using the CONSOLE port.

-
-
-
- Insert the other end of the cable into the communications port on the modem.**

To configure the BCN CONSOLE port for modem operation, refer to *Configuring Routers* (router software) or *Getting Started with Site Manager* (BayStream software).

Chapter 4

Accessing the Interior

Experienced network operators can safely perform the user-serviceable procedures that are described in Chapter 5. Only authorized Bay Networks service technicians can perform other procedures, not described in this book.

Before you can perform user-serviceable procedures, you must access the interior of your Backbone Node hardware platform, as follows:

- Remove the front bezel.
- Connect the antistatic wrist strap to the hardware platform.



Caution: Always use the wrist strap to avoid damage to electronic components when handling hardware modules.

- Remove the electromagnetic compatibility (EMC) shield from the front panel to access the interior.
- Remove and install an air flow module. (Refer to the *BLN and BCN Fuse Service Manual* for instructions.)

Depending on your hardware platform model, you need a Phillips screwdriver, standard screwdriver, or both to replace hardware components.

Removing and Replacing the Front Bezel

You must remove the front bezel (front cover) of BLN, BLN-2, and BCN routers to access their interiors.



Note: Keep the front bezel on during normal operation to comply with air flow requirements.

Remove the front bezel from the BLN ([Figure 4-1](#)) and BLN-2 ([Figure 4-2](#)) as follows:

1. **Using both hands, pull the bottom of the front bezel forward.**
2. **Remove the bezel from the chassis.**

Replace the BLN and BLN-2 front bezel as follows:

1. **Align the mounting retainers on the inside of the bezel with the holes on the front of the EMC shield.**
2. **Push the sides of the bezel into place.**

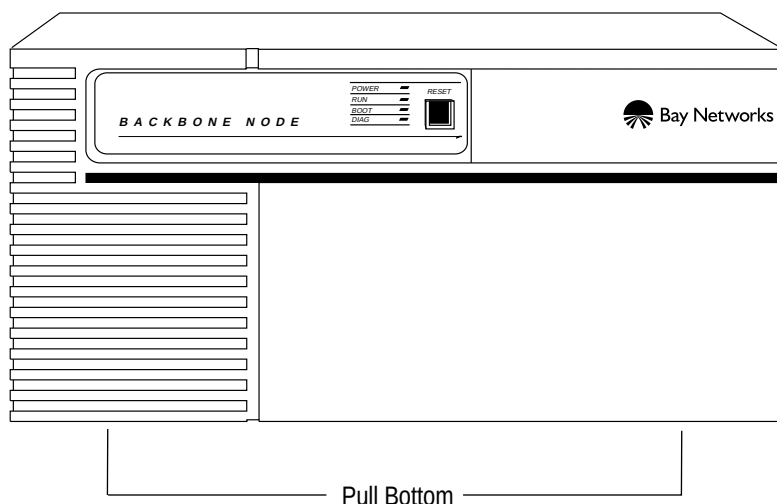


Figure 4-1. Removing the BLN Front Bezel

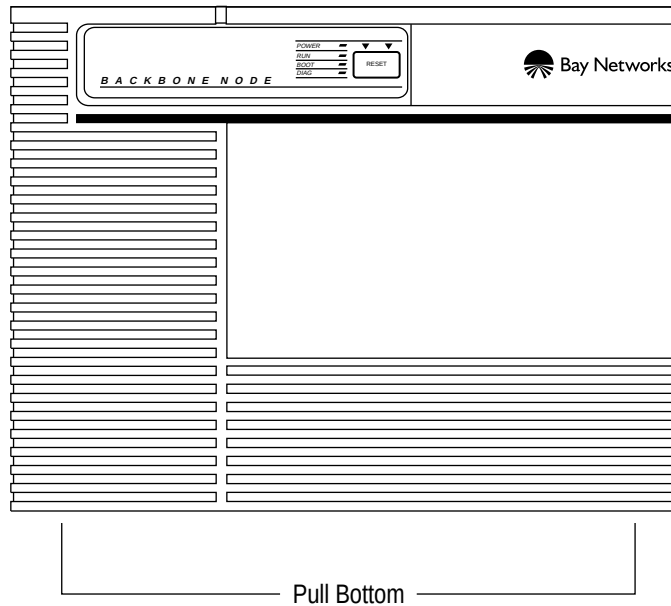


Figure 4-2. Removing the BLN-2 Front Bezel

Remove the front bezel from the BCN [\(Figure 4-3\)](#) as follows:

1. **Using both hands, pull the top of the front bezel forward.**
2. **Remove the bezel from the chassis.**

Replace the BCN front bezel as follows:

1. **Align the mounting retainers on the inside of the bezel with the holes on the front of the EMC shield.**
2. **Push the sides of the bezel into place.**

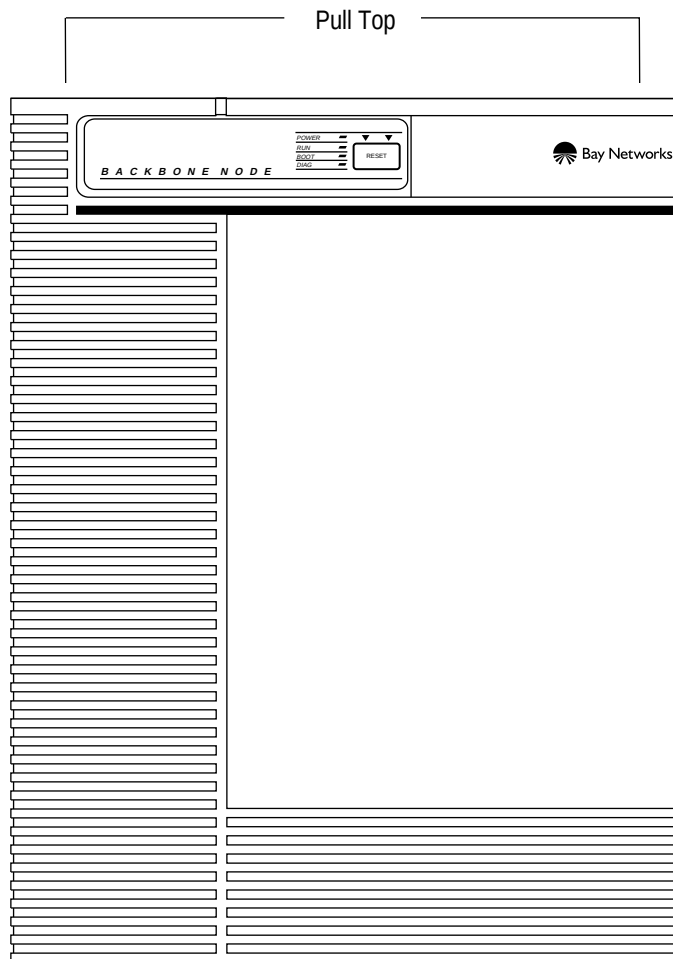


Figure 4-3. Removing the Front Bezel from the BCN

Attaching the Antistatic Wrist Strap

Each BLN, BLN-2, BCN, and BCN RLC ships with an antistatic wrist strap. You must wear an antistatic strap whenever you

- Remove, install, and handle memory cards
- Remove, install, configure, and handle hardware modules, including Fast Routing Engine (FRE or FRE-2) modules, the SRM-F (System Resource Module-Front), or any link modules
- Remove and replace module fuses

The antistatic wrist strap directs the discharge of static electricity from your body to the chassis of the hardware platform, thereby avoiding discharge to, and possible damage of, sensitive electronic components.



Caution: Electrostatic discharge can damage hardware. Follow the procedure in this section to protect your equipment from damage.

For BLN, BLN-2, BCN, and BCN RLC routers, locate the antistatic wrist strap on the inside of the front bezel (front panel). Refer to “Removing and Replacing the Front Bezel” earlier in this chapter for instructions.

Attach the antistatic wrist strap as follows:

1. **Remove the front bezel.**
2. **Remove the antistatic wrist strap from the package attached to the back of the front bezel.**
3. **Verify that the cable attaches to the wrist strap.**
4. **Place the strap around your wrist.**
5. **Adjust the strap to ensure that the metal buckle inside the strap contacts your skin.**
6. **Insert the jack into the antistatic receptacle ([Figure 4-4](#)).**

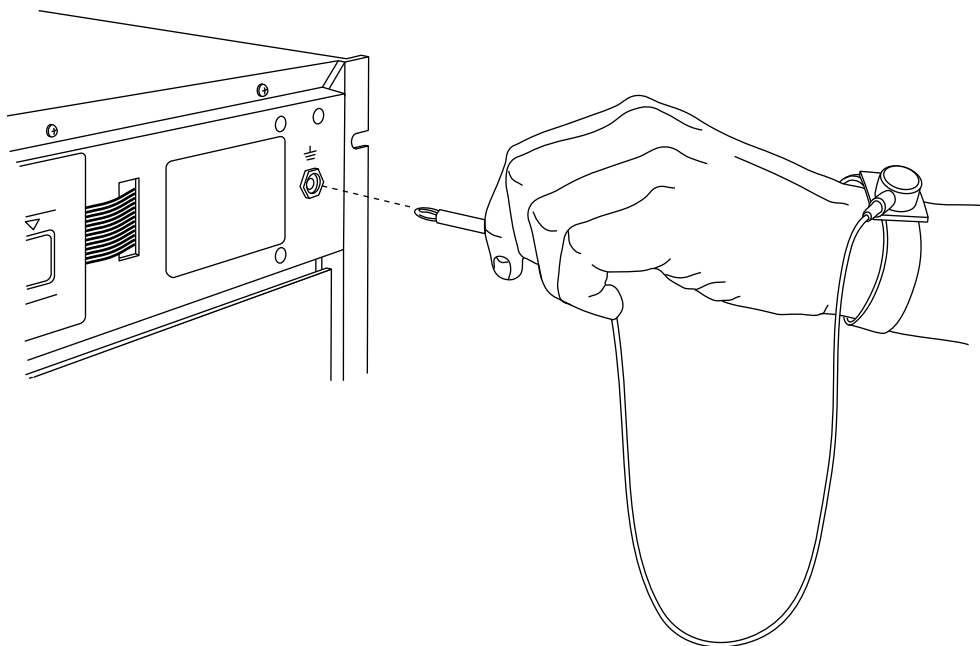


Figure 4-4. Connecting the Wrist Strap Jack to the Antistatic Receptacle

Removing and Replacing the EMC Shield

You must remove the electromagnetic compatibility (EMC) shield to access the memory cards and FRE or FRE-2 modules in the Backbone Node routers.



Caution: Do not operate a hardware platform with the EMC shield removed for more than 5 minutes. Without the EMC shield, the hardware platform may overheat. In addition, the BCN contains temperature sensors that may not detect an overheating condition without the shield in place.

Remove the EMC shield ([Figure 4-5](#)) as follows:

1. **Remove the front bezel. (Refer to “Removing and Replacing the Front Bezel” earlier in this chapter for instructions.)**
2. **Loosen the captive thumbscrews that fasten the EMC shield to the chassis.**
3. **Remove the EMC shield from the chassis.**

Replace the EMC shield as follows:

1. **Position the EMC shield in front of the chassis.**
2. **Tighten the captive thumbscrews that fasten the EMC shield to the chassis.**

To replace the front bezel, the EMC shield must be in place. Refer to “Removing and Replacing the Front Bezel” earlier in this chapter for instructions.

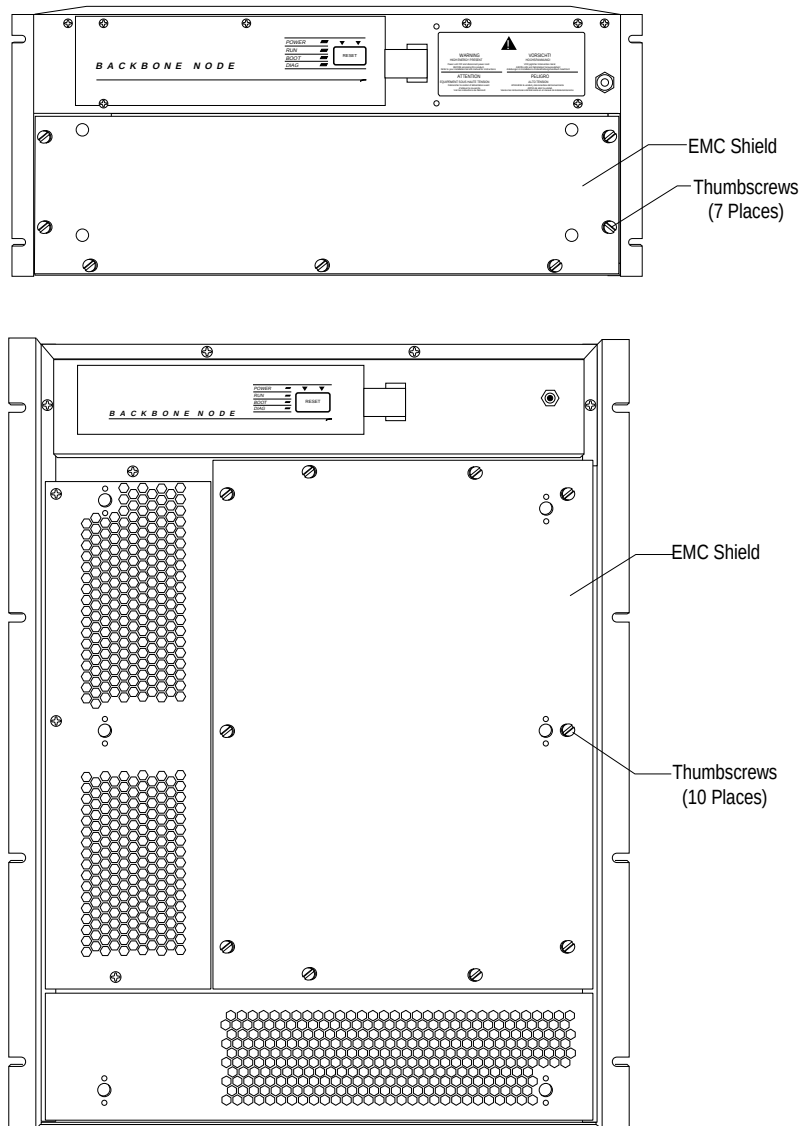


Figure 4-5. BLN and BCN EMC Shields

Removing and Installing an Air Flow Module

Bay Networks ships an air flow module in each empty FRE/FRE-2 slot in the front of all Backbone Node routers. Each air flow module redirects cool air to the adjacent FRE or FRE-2 module.

Figure 4-6 illustrates the location of an air flow module. You must remove air flow modules when replacing them with FRE or FRE-2 modules. (Refer to Chapter 5 for instructions on replacing FRE or FRE-2 modules.)

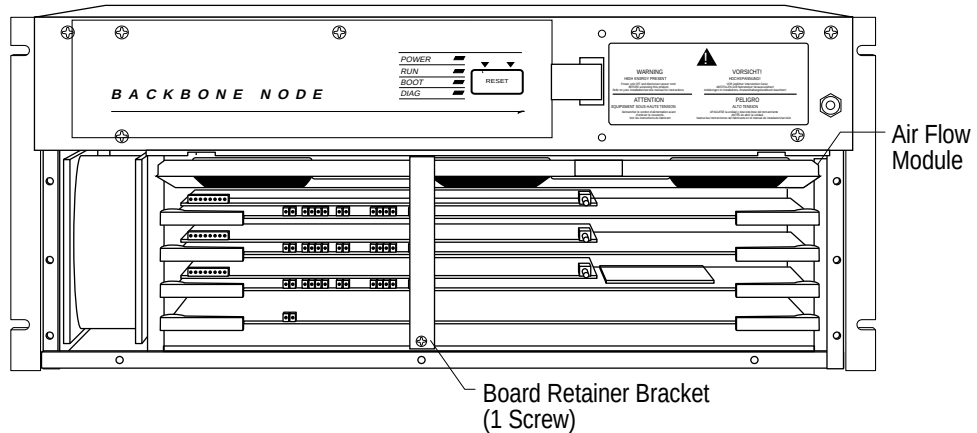


Figure 4-6. Air Flow Module Installed in a Hardware Platform

Remove an air flow module as follows:

- 1. Remove the front bezel.**

(Refer to “Removing and Replacing the Front Bezel” earlier in this chapter.)

- 2. Remove the EMC shield.**

(Refer to “Removing and Replacing the EMC Shield” earlier in this chapter.)

- 3. Remove the board retainer bracket (BLN and BLN-2 only).**

Refer to Figure 4-6.

- a. Remove the screw at the bottom of the bracket.**

A single screw fastens the bottom of the board retainer bracket to the chassis.

- b. Remove the bracket.**
- 4. Pull the front of the air flow module forward to remove it (Figure 4-7.)**

Insert an air flow module as follows:

- 1. Grasp the sides of the air flow module (Figure 4-8).**
- 2. Correctly position the back edge of the air flow module to accommodate the slot power connector and locating pin.**

(For BCNs, hold the air module vertically, with the top edge up as noted in Figure 4-8.)

- 3. Insert the air flow module as shown in Figure 4-6.**

(For BCNs, insert the air module vertically, with the top edge up as noted in Figure 4-8.)

- 4. Replace the board retainer bracket (BLN and BLN-2 only), EMC shield, and front bezel.**

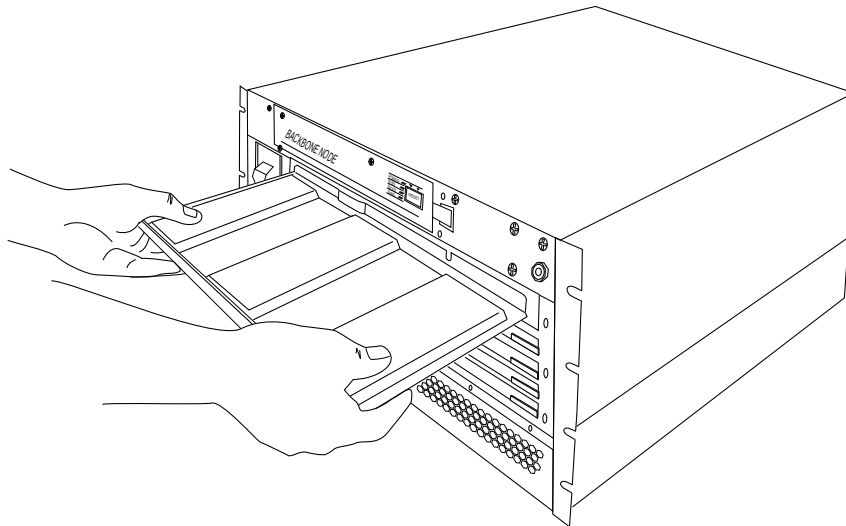


Figure 4-7. Inserting or Removing an Air Flow Module

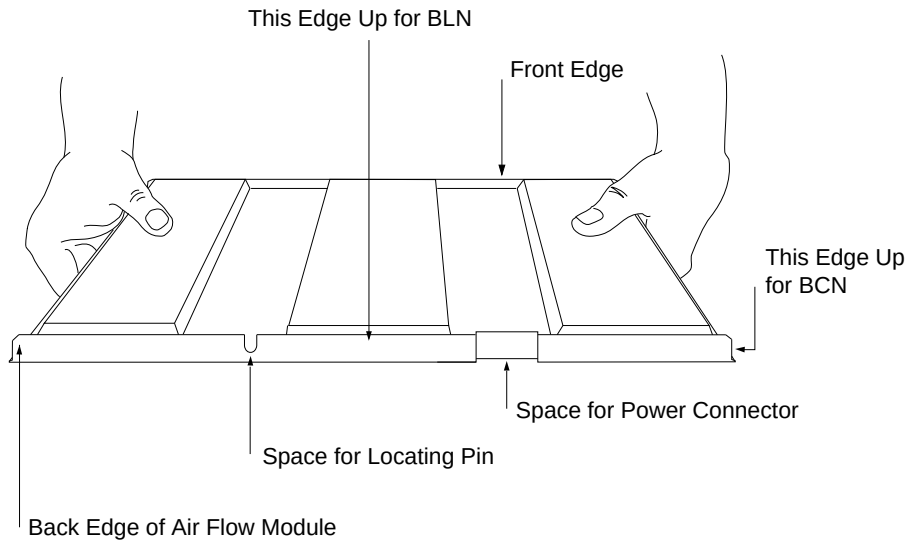


Figure 4-8. Grasping the Air Flow Module

Chapter 5

Hot-Swapping Hardware Components

Depending on your hardware platform, you can replace the following user-serviceable hardware components:

- Memory cards
- Hardware modules
 - Link modules
 - Routing Engine (FRE/FRE-2/ARE) modules
 - System Resource Module-Link (SRM-L)
 - System Resource Module-Front (SRM-F)
- Power supply modules
- Fan trays

Hot-swap capability allows experienced users to replace these components while the power is on. Refer to Table 5-1 for a list of the components that are user-serviceable for your hardware platform.

Table 5-1. User-Serviceable Components

Component	BLN (Backbone Link Node)	BLN-2 (Backbone Link Node-2)	BCN (Backbone Concentrator Node)
Memory Cards	Y	Y	Y
Link Modules	Y	Y	Y
Routing Engine Modules	Y	Y	Y
SRM-L Modules	Y	Y	Y

(continued)

Table 5-1. User-Serviceable Components *(continued)*

Component	BLN (Backbone Link Node)	BLN-2 (Backbone Link Node-2)	BCN (Backbone Concentrator Node)
SRM-F Modules	Y	Y	Y
Power Supplies	N	Y	Y
Fans	N	Y	N

Depending on your model, you will need a Phillips screwdriver, a standard screwdriver, or both to replace hardware components.

Replacing Flash and PCMCIA SRAM Memory Cards

This section describes how to remove and replace a Flash memory card or a PCMCIA SRAM memory card (Order No. 75049 or 77014). Each BN must be equipped with a minimum of one 4-MB Flash memory card or one PCMCIA SRAM memory card. Each BN supports a maximum configuration of one Flash card or PCMCIA SRAM card per FRE module. You install additional PCMCIA SRAM cards to provide redundancy, add storage capacity, and/or collect Frame Relay Switch and SMDS Switch billing data.



Note: Frame Relay Switch and SMDS Switch billing data must be collected on a dedicated PCMCIA SRAM memory card. Consequently, simultaneous support for both Frame Relay Switch and SMDS Switch billing requires a minimum of two SRAMs: one for Frame Relay billing and a second for SMDS billing. The software image, other executable files, and configuration files are stored on the Flash memory card.

When you remove a Flash card or PCMCIA SRAM card, the non-volatile file system (NVFS) disables access to the card. When you insert and format a Flash card or PCMCIA SRAM card or insert a formatted Flash card or PCMCIA SRAM card, the NVFS automatically provides access to the card.

Memory Card Read-Write Protect Switch

Memory cards are read-write protected. To change the protection on a memory card, you must physically remove the card from the BayStream hardware, change the protection, and reinsert the card. Failure to adhere to this sequence can cause unpredictable and undesirable consequences.

Use the following procedures to remove and replace a Flash memory card or a PCMCIA SRAM memory card from a BN.



Caution: Electrostatic discharge can damage hardware. Attach the antistatic strap to your wrist and connect it as described in Chapter 4 before you remove or install a memory card.

To remove a Flash or PCMCIA SRAM memory card:

1. **Remove the front bezel.**
2. **Remove the EMC shield.**
3. **Release the memory card by pressing the ejector button on the FRE or FRE-2 module ([Figure 5-1](#)).**
4. **Pull the memory card toward you.**

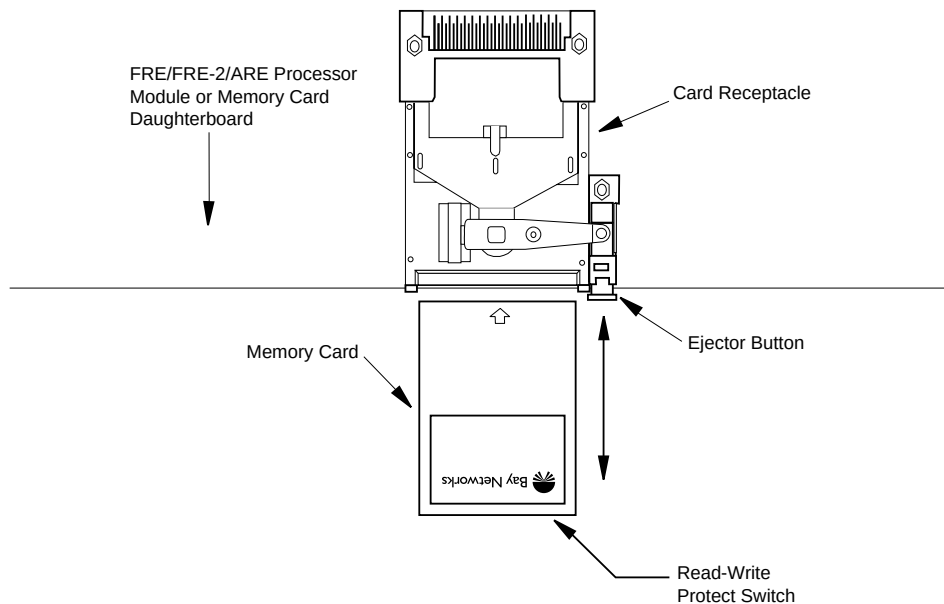


Figure 5-1. Removing a Flash or PCMCIA SRAM Memory Card

To install a Flash or PCMCIA SRAM memory card:

- 1. Position the card with the label facing up and the INSERT arrow pointing toward the card receptacle.**
- 2. Insert the card into the card receptacle.**
- 3. Gently push the card until it fits snugly into place.**
- 4. Replace the EMC shield.**
- 5. Replace the front bezel.**

If the memory card is new, and you did not obtain it from Bay Networks, you must format the card before attempting to write to it. Use Site Manager or the Technician Interface to format the memory card.

Protecting Memory Card Files

Bay Networks ships each memory card with its Read-Write Protect switch in the unprotected position ([Figure 5-2](#)). After successfully loading the configuration file and saving your configuration, you may want to write-protect the memory card for backup purposes.



Note: You typically do not operate a hardware platform with a write-protected memory card. We recommend making a copy of your configuration on another memory card, write-protecting the card, and storing it in a safe place.

To change memory card protection, complete the following steps:

1. **Remove the memory card from the hardware platform.**
 - a. **Press the rectangular ejector button adjacent to the memory card receptacle. (Refer to Figure 5-2.)**
 - b. **Pull the card toward you.**
-



Caution: You must remove the card from the hardware platform before changing the read-write protection. Failure to remove the card may result in improper write-protection.

2. **Locate the Read-Write Protect Switch on the edge opposite the arrow on the memory card (Figure 5-3).**
3. **Adjust the Read-Write Protect Switch.**

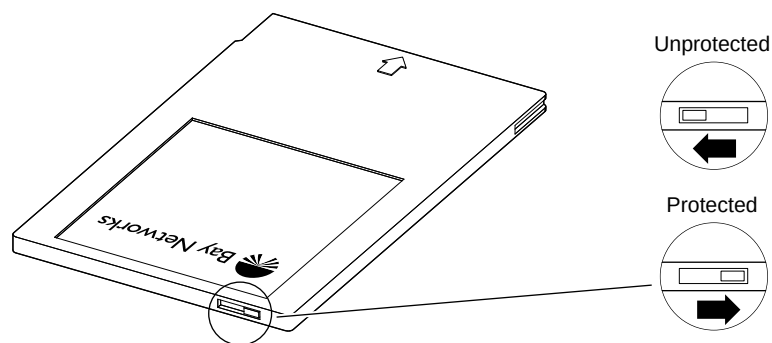


Figure 5-2. Memory Card Read-Write Protect Switch

4. **Reinsert the memory card into the card receptacle.**
 - a. **Position the card with the label facing up and the INSERT arrow pointing toward the card receptacle.**
 - b. **Insert the card into the card receptacle.**
 - c. **Gently push the card in until it fits snugly into place.**
 - d. **Close the hardware platform (refer to Chapter 4, “Accessing the Interior”).**

Replacing PCMCIA SRAM Memory Card Batteries

A 3-V lithium “coin-type” battery, described in [Table 5-2](#), provides backup power to the PCMCIA SRAM memory card, allowing it to be removed from the BayStream hardware for approximately 30 minutes without loss of stored data.

Table 5-2. PCMCIA SRAM Battery

Specification	
Diameter	23.0 mm
Thickness	2.5 mm
Weight	3.2 g
Type	CR235 (or equivalent)



Caution: While the PCMCIA SRAM card is installed in a BayStream hardware platform, there is no drain on the 3-V lithium battery. Battery drain occurs only when the PCMCIA SRAM card is removed from the BayStream platform. To ensure data integrity, we recommend that the battery be replaced yearly.

To replace the 3-V lithium battery:

1. **Insert a slender pointed object, such as the end of a paper clip, into the hole on the upper side of the SRAM card (near the battery holder).**
 2. **Release the battery holder by pressing the paper clip inward and pulling the battery holder straight out of the card.**
-



Note: When the battery holder is free of the card, the battery will fall out.

3. **Replace the old battery with a new one, making certain to match the polarity as shown on the battery holder.**
 4. **Squeeze the holder containing the new battery tightly, and reinsert it into the battery cavity until it snaps into place.**
-



Caution: The battery must be replaced within 30 minutes, or data will be lost.

Replacing a Link Module or SRM-L

The Backbone Node hot-swap feature allows you to remove and replace a link module or SRM-L with the power on or off.



Danger: A potential energy hazard exists during hot-swap service of link modules. Do not remove more than two adjacent modules without turning off the BN.

When removing or installing a link module, keep the following in mind:

- If you replace a link module with another of a different type (that is, you replace an Ethernet link module with an FDDI link module), you must first undo the configuration of all circuits on the old slot before the hardware platform software can properly configure the new module. Refer to *Configuring Routers* (router software) or *Getting Started with Site Manager* (BayStream Software) for instructions on deleting and editing a configuration file.
- When you remove a link module, connectivity to the slot in question and the services that slot provides become disrupted. The other routing engine processor modules resynchronize their routing tables after the slot fails to receive packets.
- Insert ARE link modules only in slots opposite ARE processor modules. Do not install an ARE link module in a slot opposite a FRE or FRE-2 processor module.
- The SRM-L and SRM-F (see next section) each supply two backbones. This means that two backbones become inactive if you remove one of these modules, and four backbones become inactive if you remove both. When you insert a module, its associated backbones become active.
- Before removing or installing a link module, first access the interior of your hardware platform. (Refer to Chapter 4, “Accessing the Interior,” for instructions.)



Caution: Electrostatic discharge can damage hardware. Use the antistatic wrist strap when handling any hardware platform components.

The procedures for replacing the link modules and SRM-Ls are the same for the BLN, BLN-2, and BCN. (Refer to Figure 5-3 for the BLN, Figure 5-4 for the BLN-2, and Figure 5-5 for the BCN.)

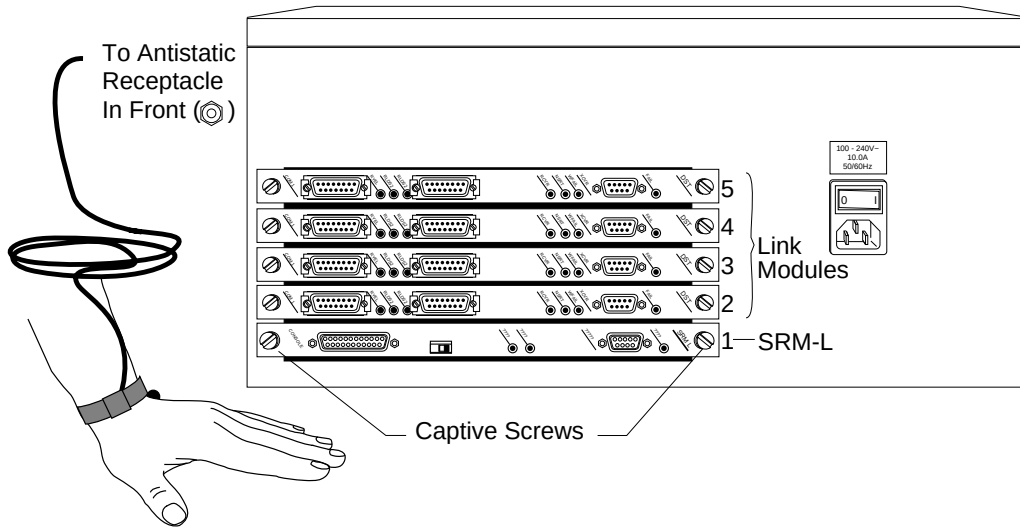


Figure 5-3. Link Modules and the SRM-L in a BLN

Remove a link module or SRM-L as follows:

1. **Disconnect any exterior cables from the module.**
2. **Loosen the two captive screws on each end of the module.**
3. **Grasp the sides of the module and pull it out of the node.**
4. **Place the module in an antistatic protective bag.**

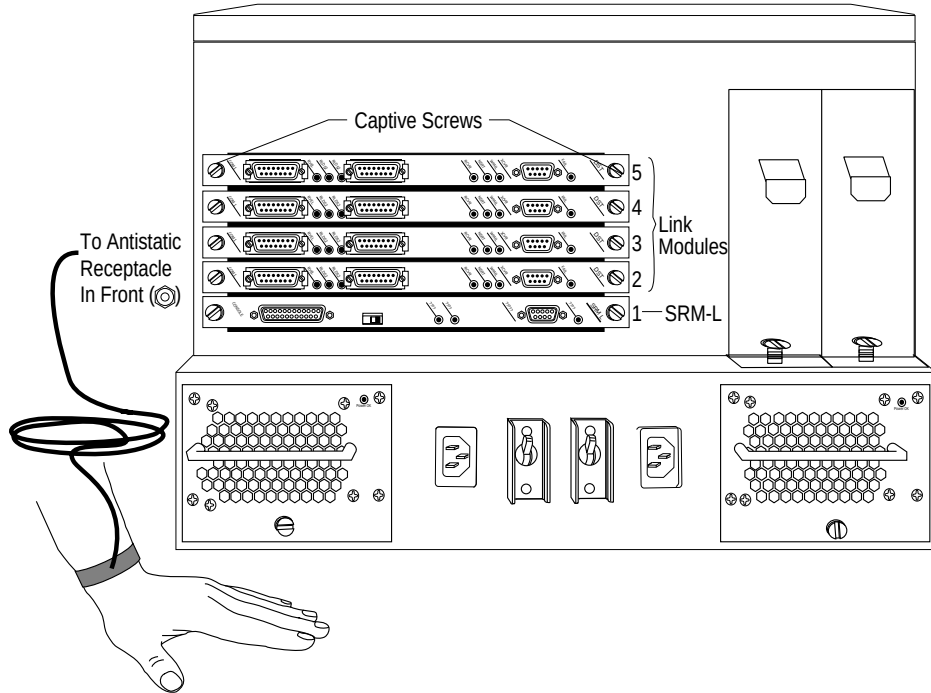


Figure 5-4. Link Modules and the SRM-L in a BLN-2

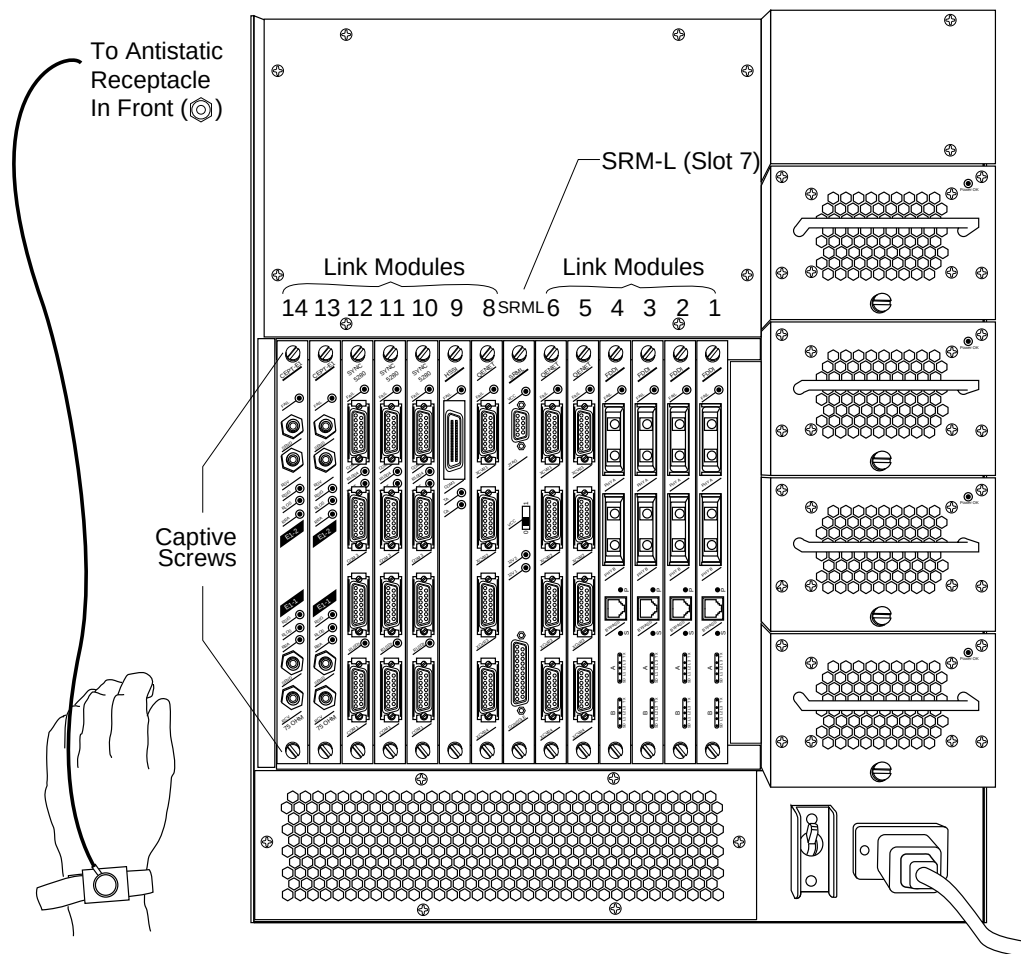


Figure 5-5. Link Modules and the SRM-L in a BCN

Install a link module or SRM-L as follows:

1. **Slide the module into the desired slot using the slot card guides.**
2. **Insert the board until its connector panel touches the hardware platform rear panel.**
3. **Secure the two captive screws on both sides of the module.**

4. Connect the desired cables to the module.



Note: We recommend that you issue the **diags** command to the associated slot, using the Bay Networks Technician Interface, immediately after you insert a link module. (Refer to *Using Technician Interface Software*.) Otherwise, the link module FAIL LED will remain lit, indicating diagnostics have not run on the ILI.

Even if you do not issue the **diags** command, the link module initializes and becomes operational as long as the board functions properly and contains the correct interface configurations.

Replacing a Routing Engine Module or SRM-F

The Backbone Node hot-swap feature allows you to remove and replace FRE/FRE-2/ARE modules or SRM-Fs with the power on or off.



Danger: A potential energy hazard exists during hot-swap service of processor modules. Do not remove more than two adjacent modules without powering off the hardware platform.

When removing or installing a routing engine processor module or an SRM-F, keep the following in mind:

- When you remove a FRE module, connections to the slot in question and the services that slot provides become disrupted. The other FRE modules resynchronize their routing tables after the slot fails to receive packets.
- The SRM-F and SRM-L (see previous section) each supply two backbones. This means two backbones become inactive if you remove one of these modules, and four backbones become inactive if you remove both. When you insert one module, its associated backbones become active.
- When you insert a routing engine processor module in a slot, and the module determines that slot power is stable, the module automatically resets as follows:
 - The module executes the diagnostics image on its memory card
 - The module completes the boot process
- Insert ARE processor modules only in slots opposite ARE link modules.

- Before removing or installing a module, you must first access the interior of your hardware platform. (Refer to Chapter 4, “Accessing the Interior,” for instructions.)



Caution: Electrostatic discharge can damage hardware. Use the antistatic wrist strap when handling any hardware platform components.

The procedures for replacing a routing engine processor module or an SRM-F are the same for the BLN, BLN-2, and BCN with one exception: you must first remove a board retainer bracket from the BLN or BLN-2 in order to gain access to the front modules.

Remove the board retainer bracket from a BLN or BLN-2 (Figure 5-6 or Figure 5-7) as follows:

1. Use a screwdriver to release the screw connecting the board retainer bracket to the chassis.
2. Gently pull the bottom of the board retainer bracket to remove it.

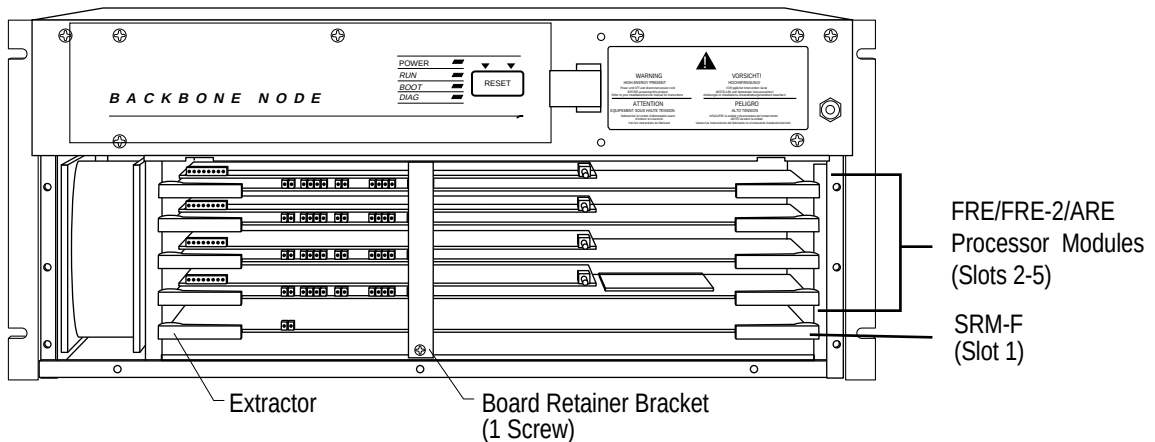


Figure 5-6. Routing Engine Modules and the SRM-F in a BLN

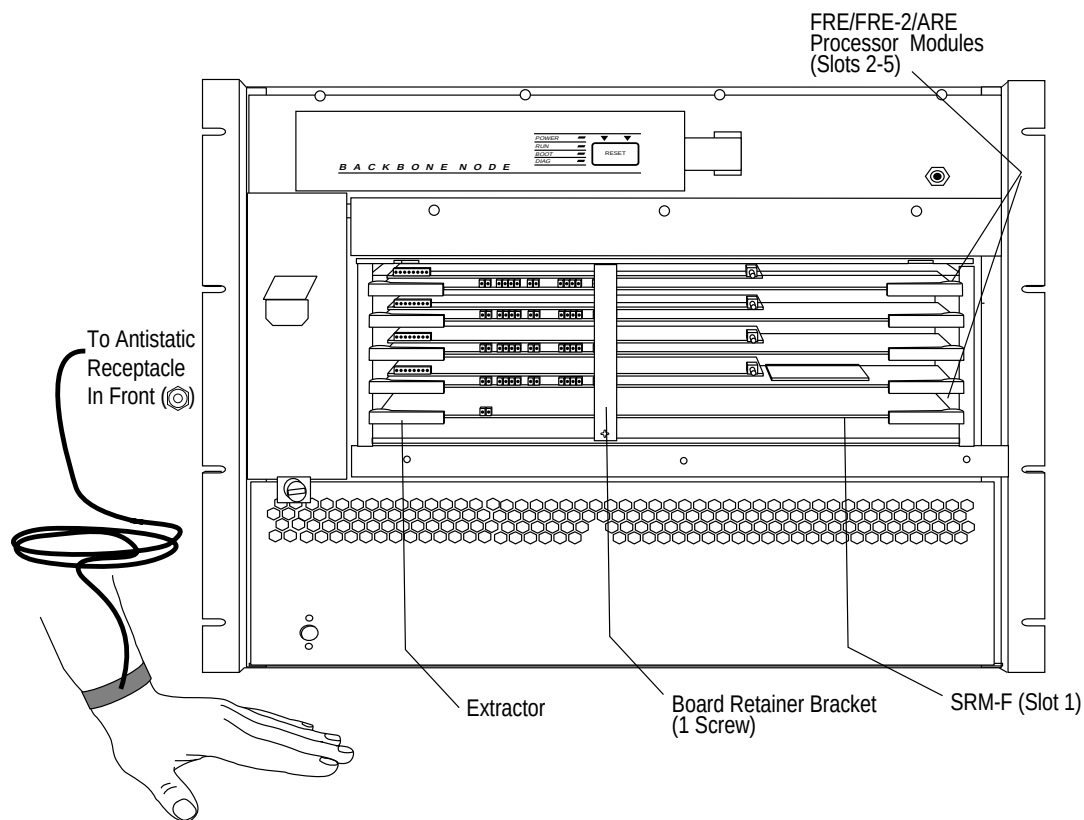


Figure 5-7. Routing Engine Modules and the SRM-F in a BLN-2



Note: Only Slot 1 (the bottom slot) in the BLN and BLN-2 can contain an SRM-F. Only Slot 7 in the BCN ([Figure 5-8](#)) can contain an SRM-F. The remaining slots can contain routing engine processor modules.

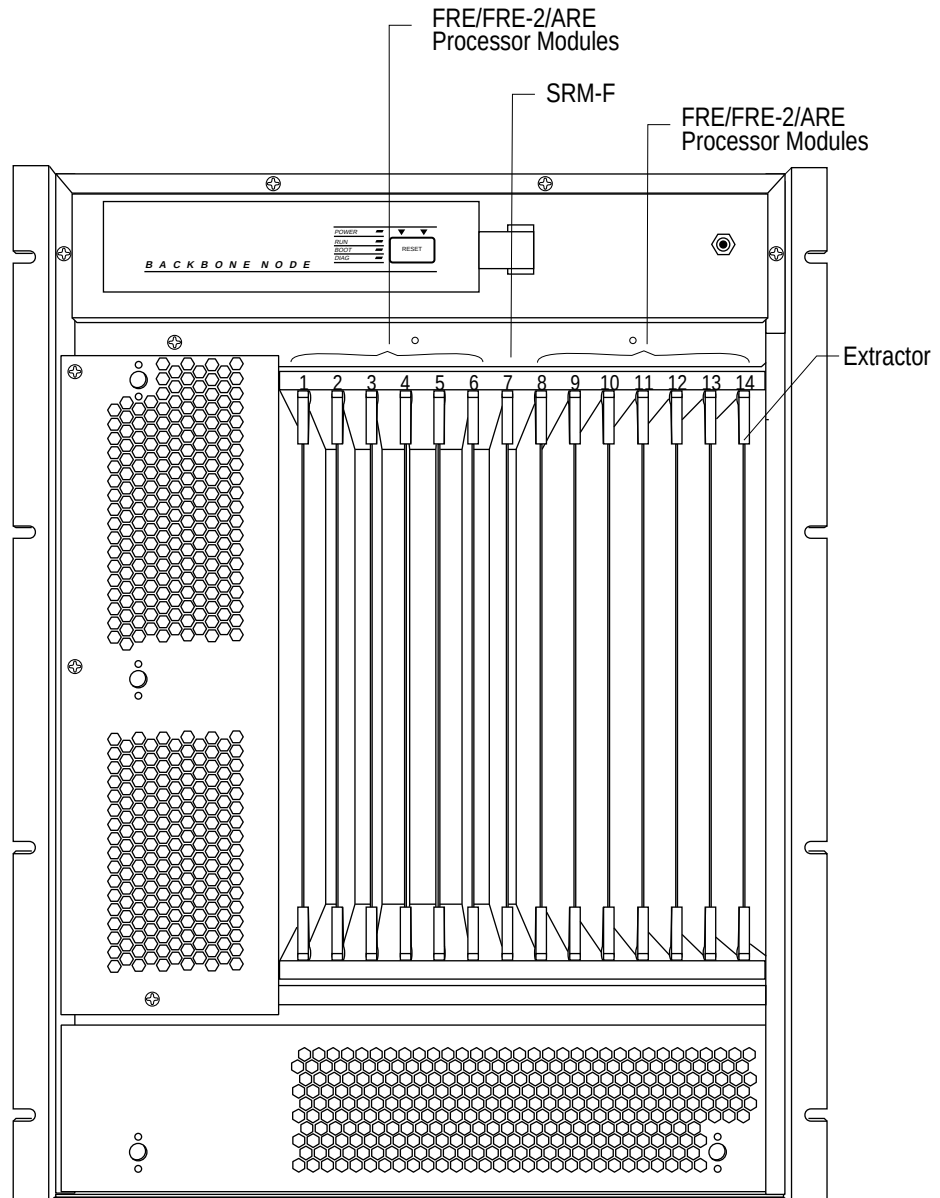


Figure 5-8. Routing Engine Modules and the SRM-F in a BCN

Remove a routing engine module or SRM-F as follows:

1. **Gently pull the inside of the board extractors at the end of the module toward you.**

The extractors swing open, pushing the module out of the backplane connectors.

2. **Place the routing engine module or SRM-F module in an antistatic protective bag.**

Insert a routing engine module or SRM-F module as follows:

1. **If the routing engine module or SRM-F contains a power switch, ensure that the switch remains pushed to the right in the *on* position ([Figure 5-9](#)).**

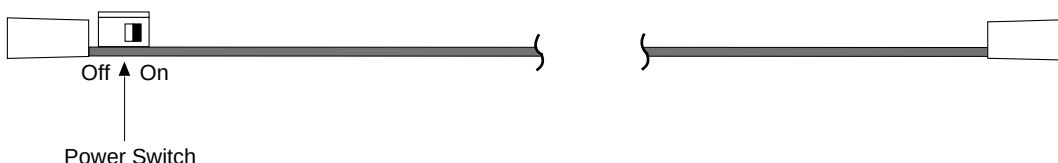


Figure 5-9. Location of Power Switch on FRE/FRE-2 Module and SRM-F



Note: If your FRE/FRE-2 or SRM-F is not equipped with a power switch, it powers on automatically when you connect it.

2. **Holding the board extractors open, slide the module into the card guides of the desired slot.**



Note: When inserting a module into a BLN or BLN-2, lift the middle of the board slightly and push it gently to ensure that the connector in the middle of the board engages.

3. Swing the extractors forward to lock the board in place.



Note: Remove the module and repeat Steps 1 and 2 if the extractors do not lock into place easily.

4. Observe the module and front-panel LEDs to determine whether the FRE/FRE-2 module or SRM-F is functioning properly.

Following is a brief description of the LED activation sequence after you insert a new FRE/FRE-2 or SRM-F module. (See the installation guide for the module for a complete description of the LEDs.)

- When you insert a FRE/FRE-2 module, the DIAG LED turns on during diagnostics and then turns off if diagnostics determine that the FRE/FRE-2 is functional.



Note: Contact the Bay Networks Technical Response Center if the DIAG LED does not turn off.

- If diagnostics determine that the FRE/FRE-2 is not functional, the DIAG LED on the front panel and LED 8 on the FRE/FRE-2 module remain on. If this occurs, ensure that the modules seat properly in the hardware platform and issue the **diags** command using the Bay Networks Technician Interface.
- If diagnostics determine that the FRE/FRE-2 is functional and a link module connects to the FRE/FRE-2, the hardware platform also performs diagnostics on the link module.

Regardless of the results of the link module diagnostics, the BOOT LED turns on, indicating that the FRE/FRE-2 is booting. If the link module or any of its ports do not function, the link module Fail LED turns on.

5. Replace the board retainer bracket in a BLN or BLN-2 as follows:

- a. Slide the top of the board retainer bracket into its designated ridge and align the bottom of the bracket with the screw hole at the bottom of the chassis (Figure 5-6 or Figure 5-7).
- b. Using a screwdriver, secure the bracket to the chassis.

6. **Replace the EMC shield and front bezel. (Refer to Chapter 4, “Accessing the Interior,” for instructions.)**

Replacing a Power Module

The BLN-2 supports two and the BCN supports four 620-watt power modules that are hot-swappable. You can easily access these power modules from the back of the hardware platform.

Each power module provides up to

- 90 amperes (A) @ +5 volts (V)
- 10 A @ +12 V
- 1 A @ -12 V
- 4 A @ +12 V (fans)

The Gate Access Management Entity (GAME) operating system generates an event message in response to any change in the status of each power module. These messages identify the power module by its slot. When looking at the rear of the BLN-2, the power module slots number 1 and 2 from left to right. The BCN power module slots number 1 through 4 from bottom to top.

Each power module has a green Power OK LED. When on, this LED indicates the power module is operational and receiving current.

When you insert an operational power module into the BLN-2 or BCN, the Power OK LED turns on. At the same time, the hardware platform automatically redistributes the load among all power modules.

When you power on either the BLN-2 or BCN, and the hardware platform provides sufficient power for redundancy, you can remove an operational power module without affecting the operation of the hardware platform. When you remove a power module, the Power OK LED on the front panel turns off, and the hardware platform automatically redistributes the load among the remaining power modules.



Note: For the BCN RLC, note that *only* the two bottom power supplies are powered by Source A, and *only* the two top power supplies are powered by Source B.

To keep the BCN RLC powered up while you turn off a power switch or remove a power cord for a power source, ensure that the other power source has two working power supplies.

If you power up the BLN-2 or BCN with an insufficient number of power modules to supply its configuration, or if you remove a power module necessary to supply sufficient power, the power modules go into overcurrent mode, and the hardware platform powers off.

The maximum number of ILIs for the BCN RLC is 10.

Before removing a power module, verify that the remaining power modules can provide sufficient power for your hardware platform. The total ampere draw for all hardware platform modules must not exceed the total ampere supply of the hardware platform power modules.

To determine if your hardware platform has enough power to support your ILI configuration:

1. **Add the ampere draw at +5 volts for each link module and routing engine processor module together to obtain the total current draw for your ILI configuration.**

Refer to the data sheets provided with each link module and routing engine processor module to determine the ampere draw at +5 volts.

2. **Add the current supply at +5 volts for each power module in the hardware platform.**

Each power module provides up to 90 amperes @ +5 volts.

3. **Subtract the total current draw (Step 1) from the total current supply (Step 2).**

If you end up with a negative number, the power supplies cannot support the ILI configuration.



Note: BCN Power - 3 power supplies support up to 13 ILIs. The fourth power supply will provide power supply redundancy (3+1).

BCN RLC Power - 4 power supplies support up to 10 ILIs (maximum loading = output of 2 power supplies). This system has power source redundancy (A+B) as well as power supply redundancy (2+2).

If you remove one power module and the remaining power modules cannot support your ILI configuration, you can remove cables, link modules, and routing engine modules until the ILI configuration draws less power than what the power modules can provide.

Replacing the BLN-2 Power Module

You can remove and replace a power module in a BLN-2 with the power on or off.



Warning: The sides of the power module are hot when removed from a BLN-2 that has been operating recently. Hold the power module by the bottom.

Remove a BLN-2 power module as follows:

1. **Loosen the captive thumbscrew until the power module disengages.**
2. **Grasp the handle and gently pull it out of the BLN-2 ([Figure 5-10](#)).**

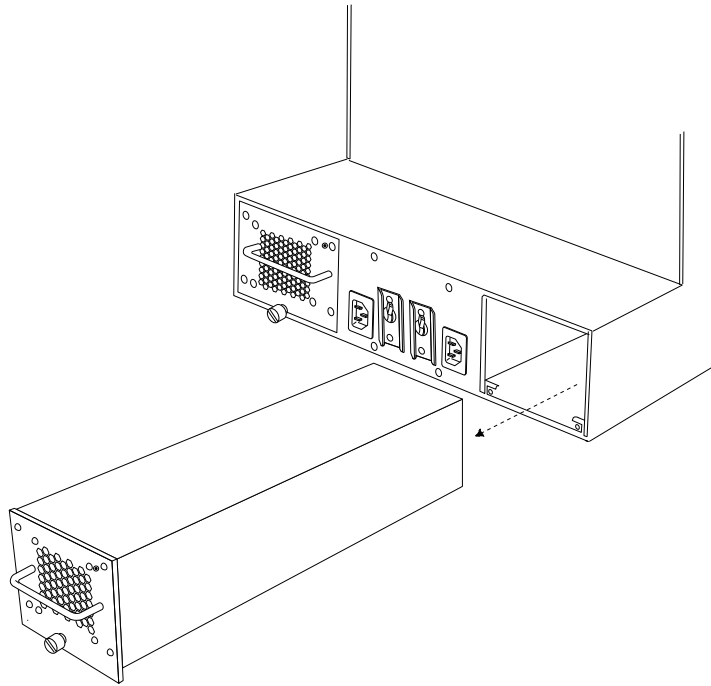


Figure 5-10. Removing a Power Module from a BLN-2

Insert a BLN-2 power module as follows:

1. **Grasp the handle and guide the module into the desired slot along the side guides and *gently* insert the module.**



Note: Stop when you feel resistance. The power module does not fully insert until you tighten the thumbscrew.

2. **Tighten the captive thumbscrew until the power module is seated firmly.**



Note: If the BN is on, the Power OK LED turns on when the power module connects to the power module backplane.

3. **Turn the captive screw no more than an additional 1/4 turn. Do *not* overtighten the screw.**

If the Power OK LED does not turn on, contact the Bay Networks Technical Response Center.

Replacing the BCN Power Module

You can remove and replace a power module in a BCN with the power on or off.



Warning: The sides of the power module are hot when removed from a BCN that has been operating recently. Hold the power module by the bottom.



Note: On the BCN RLC, the top two power supplies are powered by AC Source B and the bottom two power supplies are powered by AC Source A.

Remove a BCN power module as follows ([Figure 5-11](#)):

1. **Loosen the captive thumbscrew until the power module disengages.**
2. **Grasp the handle and pull it out of the BCN.**

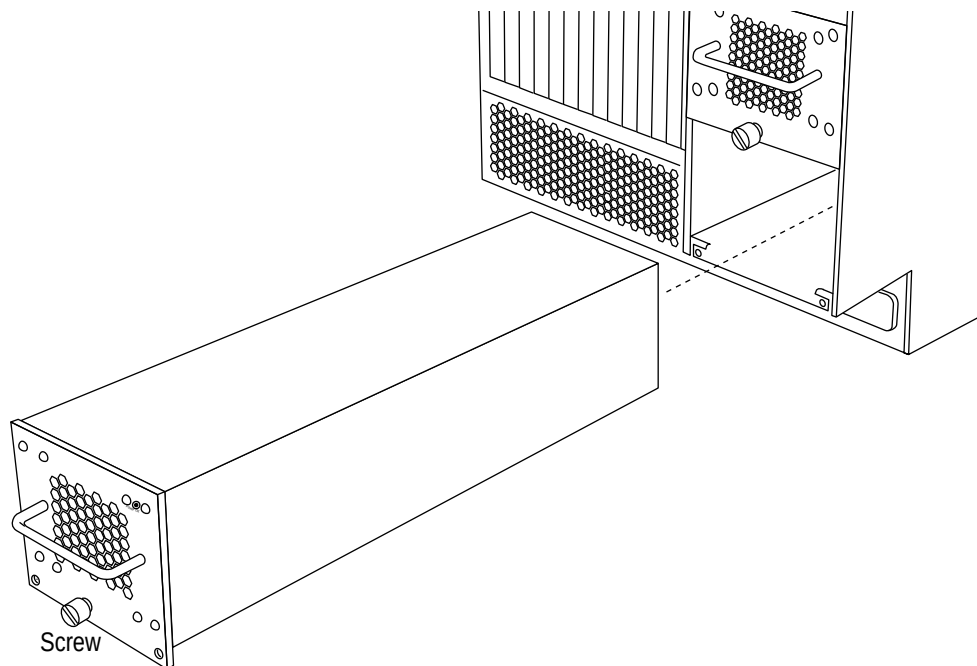


Figure 5-11. Removing a Power Module from a BCN

Insert a BCN power module as follows:

1. **Grasp the handle and guide the module into the desired slot along the side guides and *gently* insert the module.**



Note: Stop when you feel resistance. The power module does not fully insert until you tighten the thumbscrew.

2. **Tighten the captive thumbscrew until the power module is seated firmly.**



Note: If the hardware platform is on, the Power OK LED turns on when the power module connector comes into contact with the connector on the power module backplane.

3. **Turn the captive screw no more than an additional 1/4 turn. Do *not* overtighten the screw.**

If the Power OK LED does not turn on, contact the Bay Networks Technical response Center.

Replacing a Fan Tray in a BLN-2

The BLN-2 contains three fan trays — one double-fan tray under the front bezel and two single-fan trays in the rear of the unit. You can remove and replace fan trays in a BLN-2 with the power on or off.



Caution: The BLN-2 overheats if you remove the fan tray for more than 2 minutes.

Remove a double-fan tray from the front of a BLN-2 as follows ([Figure 5-12](#)):



Caution: Electrostatic discharge can damage hardware. Use the antistatic wrist strap when handling any hardware platform components.

- 1. Remove the front bezel.**

(Refer to Chapter 4, “Accessing the Interior,” for additional information.)

- 2. Remove the screw that fastens the fan tray to the chassis.**

- 3. Grasp the bottom of the fan tray and pull it out of the BLN-2.**

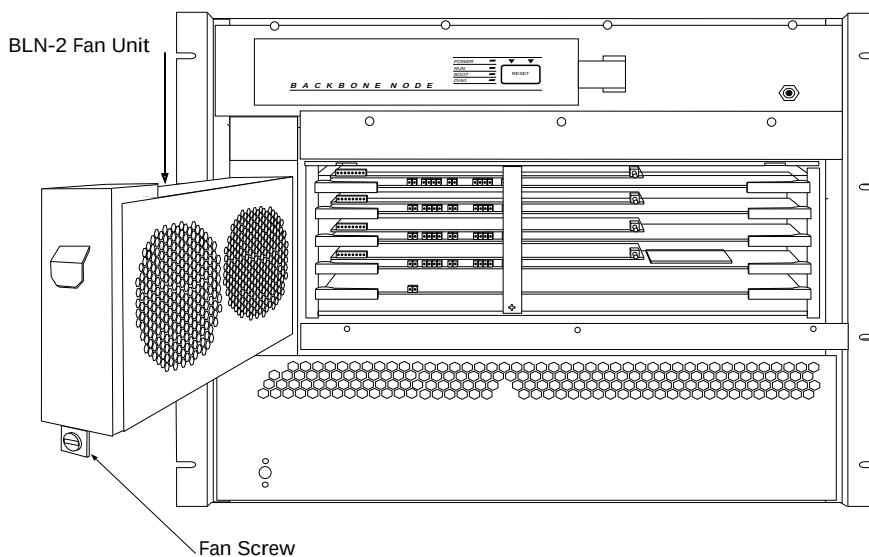


Figure 5-12. Double-Fan Tray in the BLN-2

Remove a single-fan tray from the rear of the BLN-2 as follows ([Figure 5-13](#)):



Caution: Electrostatic discharge can damage hardware. Use the antistatic wrist strap when handling any hardware platform components.

1. **Remove the screw that fastens the fan tray to the chassis.**
2. **Grasp the bottom of the fan tray and pull it out of the BLN-2.**

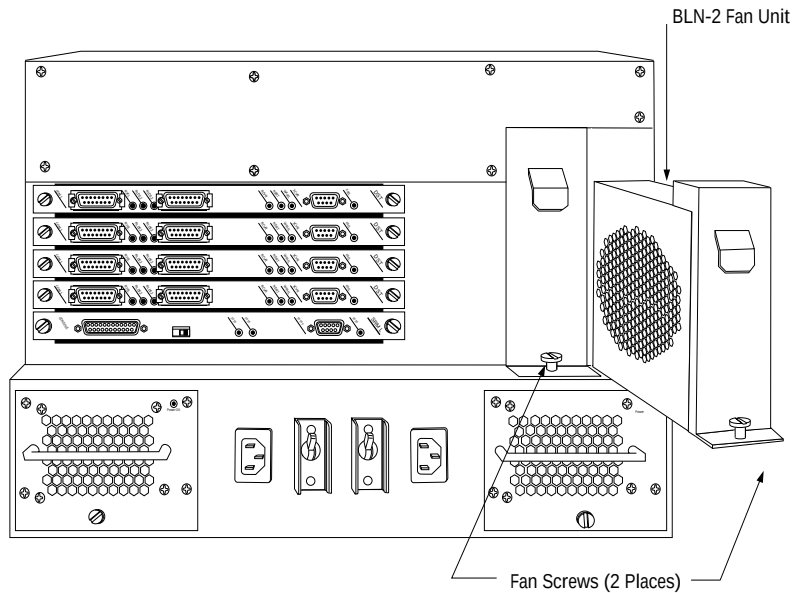


Figure 5-13. Single-Fan Trays in the BLN-2

Insert a fan tray as follows:

1. **Grasp the bottom of the fan tray and guide it into the slot until the connectors at the rear of the fan tray engage.**
2. **If the BLN-2 is on, the fans start up when the fan tray connectors fully engage.**
3. **Secure the screw that fastens the fan tray to the chassis.**

Chapter 6

Switches and LEDs

Read this chapter for a description of the switches and LEDs on the front-panel of each Backbone Node hardware platform. This chapter also describes the LED on the 620-watt BLN-2, BCN, and BCN RLC power module. For a description of the LEDs on a link or processor module, refer to the installation guide for that module.

Front Panel

You can find the Reset switch and the LEDs on the front panel of the BLN, BLN-2, BCN, and BCN RLC. Figure 6-1 shows the front-panel LEDs.

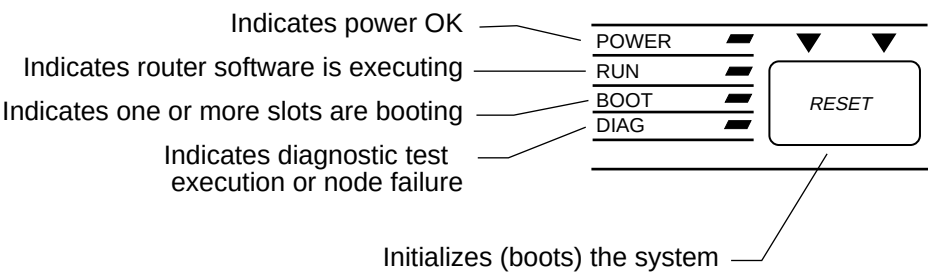


Figure 6-1. Front-Panel LEDs

Reset Switch

The Reset switch warm-starts the hardware platform. A warm-start is equivalent to issuing the **boot** command from Site Manager or the Technician Interface. Refer to *Using Technician Interface Software* (router software) or *Administration Guide* (BayStream software) for a description of the warm-start procedure.

Front-Panel LEDs

[Table 6-1](#) describes the front-panel LED functions.

Table 6-1. Front-Panel LEDs

LED	Function
Power	Indicates power supply voltages are within normal limits. The POWER LED remains on when the hardware platform is operating normally.
RUN	System software is running on one or more modules. The RUN LED remains on while the hardware platform is operating normally.

Table 6-1. Front-Panel LEDs

LED	Function
BOOT	Indicates software initialization and loading are taking place on one or more modules. The hardware platform indicates a successful startup by turning off the BOOT LED.
DIAG	Indicates diagnostic testing is taking place on one or more modules. Diagnostic testing occurs when you cold-start the hardware platform. Cold-starting occurs after a power cycle or when you issue the diags command from the Technician Interface. Diagnostic testing can take 1-to-4 minutes, depending on the configuration of each slot. The Diag LED turns off after successfully completing the diagnostic tests. The DIAG LED may also indicate a fan failure. Verify whether the problem is a fan failure by performing one of the following tasks: - View the event messages generated by the hardware platform Gate Access Management Entity (GAME) operating system. When reporting a fan failure, the GAME operating system generates the following event messages: <i>System fan module failure...</i> <i>System temperature has risen into cautionary range.</i> - Remove the EMC shield to view the FRE or FRE-2 module LEDs. If the DIAG LED on the front panel of the BN is on, and if LEDs F and 8 on all FRE modules, or LEDs E and F on all FRE-2 modules are <i>not</i> on, a fan failure has occurred. (Refer to the next section for more information about these LEDs.)

620-Watt Power Module LED

This section describes the function of the green Power OK LED on each of the 620-watt BLN-2 and BCN power modules ([Figure 6-2](#)).

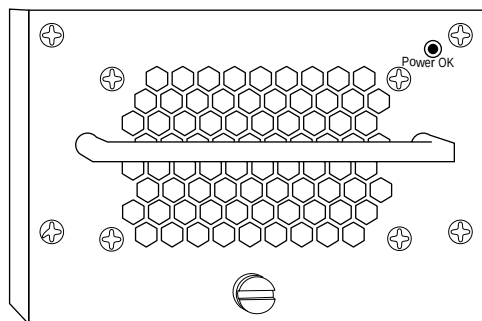


Figure 6-2. 620-Watt Power Module Power OK LED

The Power OK LED indicates that the hardware platform is powered on and that the power module is fully engaged and operational.

Appendix A

Dial-Up Services Modems

This appendix lists some modems that support Version 7 Dial-Up Services and provides configuration guidelines for specific setups. For additional information on configuring a specific modem, refer to the modem user documentation.

Adtran DSU III AR

V.35 connection and V.25bis setup:

from front panel to get menu

3 Config

1 Local

Network Options

Network Type = US Sprint SW56

Clock Source = Master

DTE Options

Connector Type = V.35

Data Format = Synchronous

DTE Command Option = V.25 Sync

CS Options = Follow RS

CD Options = Normal

TR Options = Idle when off

SR Options = Off test+OOS

Codex 3260

RS-232 connection using Raise DTR setup:

ACU Options

AT Form: DTR Dial (originating side), Sync Data (answering side)

Default Dial #3 (originating side) = Off (answering side)

Answer = Ring #1 (answering side)

Select Options

Originating side = 3

Answering side = 2

Dial From #3

View #3

Enter Phone #3

Codex 3261 Fast

V.25bis setup:

ACU Options

ACU Select = v25b
AT form = ASYNC
V25 form = Bitsync
NoAcuForm = Sync
DefaultDial = 1
Answer = Manual
Async Echo = On
CharLength = 10
v25Char = ASCII
SyncIdle = Char
V.25Resp = V25bis
Parity = V.25bis
AT msg = Before CD
R1stCode = Enable
R1stForm = Verbose
ConMsg = DTE Rate
RelMsg = Off
LPDA2 Addr = FF
LPDA2 ID = 326X
LPDA2 Det = Enable
Call Progress = 4

Terminal Options

DTE Rate = 9600
Flow = Tx Clk
TPDly Min = Rx Clk
Speed Cover = On
DTR = 108.2
RTS = Normal
CTS = Normal
RtsCtsDelay = 0
DCD = Normal
Rem Rts/Dcd = Codex
DCD loss Dis = s10
DSR = Normal
Overspeed = 1%
DTR Delay = s25
dte ct 140 = Off
dte ct 141 = Off
dtr pin 25 = test
ext select = Off
Ext cntrl = pin 14
Inactivity = s30

Multi-Tech Multi-Modem

V.25bis setup:

DIP Switches

1 : up

2 : up

3 : down

4 : up

5 : up

6 : down

7 : up

8 : down

9 : down

10 : up

11 : down

12 : up

NEC N6450 Data Service Unit

V.25bis setup:

DTE

DTE Command Set = V.25 Sync

V.35

TX Clock = Norm

DTR = Go Idle with DTR

DCD = Off when RX idle

CTS = On with RTS only, CTS Delay short

DSR = Off when Out of Service (OOS) only

Sync or Async = Sync

Auto Ans: Answer all the time

Raise DTR setup:

Change above settings to

DTE

DTR = Dial 1 with DTR (originating side)

DTR = Go Idle with DTR (answering side)

Edit

Dial 1 = enter phone number

NEC N963E Plus (RS232)

V.25bis setup:

Jumpers

1 : OFF

2 : ON V.25bis

3 : ON hdlc

4 : OFF speed

5 : OFF speed

6 : OFF ascii

7 : OFF

8 : OFF

Raise DTR setup:

Jumpers

1 : ON

2 : OFF sync

3 : OFF

4 : OFF speed

5 : OFF speed

6 : OFF ascii

7 : OFF

8 : OFF

Telebit T3000

When configuring the modem, place the A/B switch in the A position. Configuration A is the default terminal emulation.

V.25bis setup:

at&f16 – preset configuration

att – enables dial tone

at&w1 – save config to configuration B

If the hardware platform is reporting AB errors, set ats64 = 1

Raise DTR setup:

Originating Side

at&f16 – preset configuration

att – enables dial tone

ats104 = 1 – Raise DTR

at~N1 = 5411 (telephone number) – B config uses phone #2

at~L – list phone numbers

ats100 = 0

ats253 = 0

at&w1 - save config to configuration B

Telebit T3000 *(continued)*

Raise DTR setup (continued):

Answering Side

at&f16 – preset configuration

att – enables dial tone

ats104 = 4 – Raise DTR

at~N1 = 5411 (telephone number) – B config uses phone #2

at~L – list phone numbers

ats100 = 0

ats253 = 0

at&w1 - save config to configuration B

For Telebit Firmware Version 7.05 or higher, also set the following:

ats119 = 1

at~d1

s321 = 1

at&w1

at~d0

Tylink SNS 4000 (V.35 ISDN PRI DSU)

- Tested in back-to-back IMUX mode
- Tested with V.25bis only

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